IBM

IBM Systems - iSeries

Systems management
Performance Tools reports

Version 5 Release 4

IBM

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> **Note**
>
> Before using this information and the product it supports, read the information in "Notices," on page 107.

Sixth Edition (February 2006)

This edition applies to version 5, release 4, modification 0 of IBM i5/OS (product number 5722-SS1) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

Contents

Performance Tools reports

Performance Tools reports provide information on data that has been collected over time. Use these reports to get additional information about the performance and use of system resources.

The Performance Tools reports provide an easy way for you to look at your collected data and isolate performance problems. After you have collected performance data over time, you can print the reports to see how and where system resources are being used. The reports can direct you to specific application programs, users, or inefficient workloads that are causing slower overall response times.

Collection Services provides data for most of the Performance Tools reports with the exception of the Transaction, Lock, and Trace reports. You must use the Start Performance Trace (STRPFRTRC) and End Performance Trace (ENDPFRTRC) commands to collect the trace information for those three reports.

The following list describes each report, gives a brief overview as to why you would use a particular report, and links to samples of each report. In addition, each report is discussed in detail in the Performance Tools book.

Overview of Performance Tools reports			
Report	Description	What is shown	How you use the information
"Example: System Report" on page 4	Uses Collection Services data to provide an overview of how the system is operating. The report contains summary information on the workload, resource use, storage pool utilization, disk utilization, and communications. Run and print this report often to give you a general idea of your system use.	System workload. The report includes the database capabilities data.	Workload projection
"Example: Component Report" on page 12	Uses Collection Services data to provide information about the same components of system performance as a System Report, but at a greater level of detail. This report helps you find which jobs are consuming high amounts of system resources, such as CPU, disk, and so on.	Resource use, communications, system and user jobs. The report includes the database capabilities data and the Interactive Feature utilization.	Hardware growth and configuration processing trends
"Example: Transaction Reports" on page 23	Uses trace data to provide detailed information about the transactions that occurred during the performance data collection.	Workload and utilization of CPU, disk, main storage, transaction workload, object contention	Workload projection, pool configuration, application design, file contention, and program use

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Overview of Performance Tools reports			
Report	Description	What is shown	How you use the information
"Example: Lock Report" on page 38	Uses trace data to provide information about lock and seize conflicts during system operation. With this information you can determine if jobs are being delayed during processing because of unsatisfied lock requests or internal machine seize conflicts. These conditions are also called waits. If they are occurring, you can determine which objects the jobs are waiting for and the length of the wait.	File, record, or object contention by time; the holding job or object name; the requesting job or object name	Problem analysis. Reduction or elimination of object contention.
"Example: Batch Job Trace Report" on page 40	Uses trace data to show the progression of different job types (for example, batch jobs) traced through time. Resources utilized, exceptions, and state transitions are reported.	Job class time-slice end and trace data	Problem analysis and batch job progress
"Example: Job Interval Report" on page 42	Uses Collection Services data to show information on all or selected intervals and jobs, including detail and summary information for interactive jobs and for noninteractive jobs. Because the report can be long, you may want to limit the output by selecting the intervals and jobs you want to include.	Jobs by interval	Job data
"Example: Pool Interval Report" on page 46	Uses Collection Services data to provide a section on subsystem activity and a section on pool activity. Data is shown for each sample interval. Because the report can be long, you may want to limit the output by selecting the intervals and jobs you want to include.	Pools by interval	Pool data
"Example: Resource Interval Report" on page 48	Uses Collection Services data to provide resource information on all or selected intervals. Because the report can be long, you may want to limit the output by selecting the intervals you want to include.	Resources by interval	System resource use

Performance explorer and Collection Services are separate collecting agents. Each one produces its own set of database files that contain grouped sets of collected data. You can run both collections at the same time.

Related concepts

"Print the performance reports"
You can print reports using the performance data that you collected. Prior to V5R1, Option 3 (Print performance report) displayed a list of performance members that were located in the QAPMCONF file.

Related information

Collection Services

Collect information about an application's performance

Performance Tools PDF

Performance explorer reports

PM iSeries reports

Print the performance reports

You can print reports using the performance data that you collected. Prior to V5R1, Option 3 (Print performance report) displayed a list of performance members that were located in the QAPMCONF file.

This list included both sample data and trace data that was collected by the Start Performance Monitor (STRPFRMON) command. Collection Services does not collect trace data. However, you can use the STRPFRTRC and TRCINT commands to collect trace data. This data is located in the QAPMDMPT file. Therefore, in V5R1 and later, you see two views of the Print Performance Report display, one for sample data and one for trace data.

Note: If your trace data and sample data are both in the current library, you can use F20 to toggle between the two Print Performance Report displays.

After you have collected your data, you must create a set of performance data files from the performance information stored in a management collection (*MGTCOL) object. Use the Create Performance Data (CRTPFRDTA) command. After you have created the data files, you can request to print your reports.

Use the following commands to print reports for sample data that you collected with Collection Services:
- Print System Report (PRTSYSRPT)
- Print Component Report (PRTCPTRPT)
- Print Job Interval Report (PRTJOBRPT)
- Print Pool Report (PRTPOLRPT)
- Print Resource Report (PRTRSCRPT)

Use the following commands to print reports for trace data that you collected with the Start Performance Trace (STRPFRTRC) and Trace Internal (TRCINT) commands:
- Print Transaction Report (PRTTNSRPT)
- Print Lock Report (PRTLCKRPT)
- Print Job Trace Report (PRTTRCRPT)

Note: You must use the End Performance Trace (ENDPFRTRC) command to stop the collection of performance trace data and then optionally write performance trace data to a database file before you can print the Transaction reports.

Related concepts

"Performance Tools reports," on page 1
Performance Tools reports provide information on data that has been collected over time. Use these reports to get additional information about the performance and use of system resources.

Example: System Report

Related reference

"Performance Report columns" on page 59
Each report includes columns of information. Look here for descriptions of that information.

System Report - Workload

The Workload section of the system report displays the interactive and non-interactive workload of the system.

Changes to the workload section of the System Report include:
- This report shows individual CPU utilization for all processors in dedicated processor partitions. In shared processor partitions, individual CPU utilization rows are not printed.

Example

The first part of the Workload section of the System Report displays the Interactive Workload of the system. The second part of the Workload section displays the Non-Interactive Workload of the system.

```
                                                    System Report                               6/26/04 16:06
                                                       Workload                                        Page 0
Member   . . . : PNT6PERF   Model/Serial  . : 825/10-5M0FM      Main storage . . : 8192.0 MB  Started  . . . . : 04/07/04 19:11
  Library . . : CARR098R01 System name . . : CARREGT            Version/Release :   5/ 4.0   Stopped  . . . . : 04/07/04 20:15
Partition ID  : 000        Feature Code  . : 7415-2472-7415     Int Threshold  . : 100.00 %
Virtual Processors: 32     Processor Units : 32.0
QPFRADJ . . . : 0          QDYNPTYSCD  . . : 1                  QDYNPTYADJ . . . : 1
Interactive Workload
    Job            Number          Average     Logical DB      -------- Printer ----------    Communications       MRT
    Type         Transactions      Response     I/O Count       Lines          Pages            I/O Count       Max ime
------------    ----------------    --------   ----------------  -------------   ---------      --------------     -------
Interactive          3,242           .65          16,734         12,910           339                 0              0
DDM Server               0           .00         864,667            443            23          1,596,096             0
PassThru             6,645           .68         343,262      1,119,009        27,769                240             0
Total                9,887                      1,224,663      1,132,362        28,131          1,596,336
Average                              .67
-----------------------------------------------------------------------------------------------------------------------
Non-Interactive Workload
    Job          Number        Logical DB      --------- Printer ---------   Communications    CPU Per        Logical
    Type         Of Jobs       I/O Count         Lines          Pages          I/O Count      Logical I/O    I/O/Second
---------      ---------    ----------------    -------------   ----------    --------------   -----------    ----------
Batch            18,151     1,030,253,068       18,656,603       544,032       1,531,738         .0001        95,526.4
Spool                70             1,066          14,933           369               0          .0285              .0
AutoStart            56           426,047       1,692,060        41,502         178,288          .0008            39.5
COLLECTION            1             2,910               0             0               0          .0171              .2
SQL                 192         3,252,232           3,519            88               0          .0003           301.5
MGMTCENTRAL           2            12,229               0             0               0          .0046             1.1
Total            18,903     1,033,969,357      20,367,115       585,991       1,713,007
Average                                                                                         .0003        95,871.0
Average CPU Utilization . . . . . . . . . . . .:  61.0
CPU 1 Utilization . . . . . . . . . . . . . . .:  55.4
CPU 2 Utilization . . . . . . . . . . . . . . .:  57.9
CPU 3 Utilization . . . . . . . . . . . . . . .:  61.5
CPU 4 Utilization . . . . . . . . . . . . . . .:  62.2
CPU 5 Utilization . . . . . . . . . . . . . . .:  62.0
CPU 6 Utilization . . . . . . . . . . . . . . .:  60.1
CPU 7 Utilization . . . . . . . . . . . . . . .:  61.7
CPU 8 Utilization . . . . . . . . . . . . . . .:  63.1
CPU 9 Utilization . . . . . . . . . . . . . . .:  55.4
CPU 10 Utilization. . . . . . . . . . . . . . .:  56.0
CPU 11 Utilization. . . . . . . . . . . . . . .:  59.9
CPU 12 Utilization. . . . . . . . . . . . . . .:  60.6
CPU 13 Utilization. . . . . . . . . . . . . . .:  60.9
CPU 14 Utilization. . . . . . . . . . . . . . .:  62.5
CPU 15 Utilization. . . . . . . . . . . . . . .:  63.7
CPU 16 Utilization. . . . . . . . . . . . . . .:  64.1
CPU 17 Utilization. . . . . . . . . . . . . . .:  54.7
CPU 18 Utilization. . . . . . . . . . . . . . .:  57.3
CPU 19 Utilization. . . . . . . . . . . . . . .:  59.8
```

```
CPU 20 Utilization. . . . . . . . . . . . . .: 60.6
CPU 21 Utilization. . . . . . . . . . . . . .: 61.6
CPU 22 Utilization. . . . . . . . . . . . . .: 62.9
CPU 23 Utilization. . . . . . . . . . . . . .: 63.9
CPU 24 Utilization. . . . . . . . . . . . . .: 64.7
CPU 25 Utilization. . . . . . . . . . . . . .: 57.0
CPU 26 Utilization. . . . . . . . . . . . . .: 55.2
CPU 27 Utilization. . . . . . . . . . . . . .: 66.2
CPU 28 Utilization. . . . . . . . . . . . . .: 61.1
CPU 29 Utilization. . . . . . . . . . . . . .: 62.4
CPU 30 Utilization. . . . . . . . . . . . . .: 63.2
CPU 31 Utilization. . . . . . . . . . . . . .: 66.2
CPU 32 Utilization. . . . . . . . . . . . . .: 66.4

Total CPU Utilization (Interactive Feature) . . :    .0
Total CPU Utilization (Database Capability) . . : 51.6
```

System Report - Resource Utilization

The Resource Utilization section of the System Report shows the average resource utilization per interactive transaction. Use it to note changes in resource utilization from one measurement period to another and to determine resource utilization trends.

Int Threshold, Virtual Processors, and Processor Units reflect the configuration when the collection started. The values in these columns might change because of dynamic changes in logical partition configurations.

Example

```
                                     System Report                           10/02/03 16:35:52
                                   Resource Utilization                          Page 0002
                               Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4 GB  Started  . . . . : 10/02/03 12:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release :   5/ 3.0   Stopped . . . . : 10/02/03 16:00:00
Partition ID  : 003        Feature Code  . : 7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
                  ------------------- Average Per Transaction --------------------
                                        Sync     Async
        Job       Response      CPU     Disk     Disk        DB
        Type      Seconds     Seconds   I/O      I/O         I/O          Faults
      -------------  --------  ---------  -------------  -----------  ---------  ---------------
      PassThru      3.17       .06       33.6     17.2        44.5         46,260
      Average       3.17       .06       33.6     17.2        44.5         46,260
-------------------------------------------------------------------------------------------------
                     Tns     Active
------------------------------ Disk I/O Per Second -----------------------------
        Job       CPU    /Hour   Jobs Per    Total
----------- Synchronous ----------- ---------- Asynchronous ----------
        Type      Util    Rate    Interval     I/O     DBR     DBW    NDBR    NDBW    DBR     DBW    NDBR    NDBW
      ------------------  -----  -----------  --------  --------  -------  -------  -------  -------  -------  -------  -------  -------
      PassThru      .4      900       1        12.7     .5      1.0      3.7     3.1     .3      1.6     .1      2.2
      Batch        5.0       0        7        43.9     .6      5.7      2.1     1.9     1.6     30.1    .3      1.3
      iSeries Access-Bch  .1   0        0         .6     .0      .0       .1      .2      .0      .0      .0      .1
      HTTP          .3       0        0        1.4     .0      .0       .9      .3      .0      .0      .0      .0
      COLLECTION    .0       0        0         .6     .1      .1       .0      .0      .1      .1      .0      .0
      MANAGED       .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      DIRSRV        .6       0        0        2.4     .0      .0       .0      1.4     .0      .3      .0      .4
      SYSTEM        .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      OS400         .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      SNMP          .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      SQL          83.9      0        0       182.4    1.7     4.8      1.3     3.4     1.1     8.8     .0     161.1
      TOC           .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      FTP           .0       0        0        1.3     .1      .0       .3      .1      .0      .0      .3      .1
      QOS           .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      SMTP          .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      TELNET        .0       0        0         .1     .0      .0       .0      .0      .0      .0      .0      .0
      REMOTE        .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      MGMTCENTRAL   .1       0        0         .2     .0      .0       .1      .0      .0      .0      .0      .0
      NETSERVER     .0       0        0         .0     .0      .0       .0      .0      .0      .0      .0      .0
      WSA          6.5       0        0        11.4     .0      .0       1.3     2.6     .0      5.3     .0      1.9
      Average      97.2      900      9       257.6    3.3     12.0     10.5    13.5    3.2     46.5    .8     167.4
```

System Report - Resource Utilization Expansion

The Resource Utilization Expansion section of the System Report gives the average resource use per transaction by job type.

Example

```
                                      System Report                           10/02/03 16:35:52
                               Resource Utilization Expansion                        Page 0004
                                Perf data from 14:00 to 16:00 at 1 min
Member   . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :  56.4 GB  Started . . . . : 10/02/03 12:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release :  5/ 3.0   Stopped . . . . : 10/02/03 16:00:00
Partition ID  : 003        Feature Code  . : 7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
Interactive Resource Utilization Expansion
```

Interactive Resource Utilization Expansion — Average Per Transaction

Job Type	Physical Disk I/O Synchronous DBR	DBW	NDBR	NDBW	Asynchronous DBR	DBW	NDBR	NDBW	Logical Data Base I/O Read	Write	Other	Communications I/O Get	Put
PassThru	2.11	4.09	14.94	12.54	1.44	6.49	.52	8.81	28.63	15.51	.38	.0	.0
Average	2.11	4.09	14.94	12.54	1.44	6.49	.52	8.81	28.63	15.51	.38	.0	.0

Non-Interactive Resource Utilization Expansion — Average Per Second

Job Type	Physical Disk I/O Synchronous DBR	DBW	NDBR	NDBW	Asynchronous DBR	DBW	NDBR	NDBW	Logical Data Base I/O Read	Write	Other	Communications I/O Get	Put
Batch	.6	5.7	2.1	1.9	1.6	30.1	.3	1.3	331.9	3.7	106.6	.0	.0
iSeries Access	.0	.0	.1	.2	.0	.0	.0	.1	.0	.0	.0	.0	.0
HTTP	.0	.0	.9	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
COLLECTION	.1	.1	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0
MANAGED	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
DIRSRV	.0	.0	.0	1.4	.0	.3	.0	.4	.0	.0	.0	.0	.0
SYSTEM	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
OS400	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
SNMP	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
SQL	1.7	4.8	1.3	3.4	1.1	8.8	.0	161.1	144.5	2.6	182.4	.0	.0
TOC	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
FTP	.1	.0	.3	.1	.0	.0	.3	.1	.0	.0	.0	.0	.0
QOS	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
SMTP	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
TELNET	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
REMOTE	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
MGMTCENTRAL	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
NETSERVER	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
WSA	.0	.0	1.3	2.6	.0	5.3	.0	1.9	.0	.0	.0	.0	.0
Average	.7	5.7	2.3	2.1	1.6	30.2	.3	1.4	332.0	3.7	106.6	.0	.0

Priority	Job Type	CPU Util	Cum Util	Faults	Disk I/O Sync	Async	CPU Per I/O Sync	Async	DIO /Sec Sync	Async

System Report - Storage Pool Utilization

Use the Storage Pool Utilization section of the System Report to help you set the storage pool size and activity level.

Changes to this section of the System Report include:

- Columns DB and Non DB are expanded 1 space.
- The values under the Size column are changed to be expressed in megabytes.

Example

```
                                      System Report                            5/27/04 10:48:5
                              Storage Pool Utilization                              Page 000
```

Pool ID	Expert Cache	Size (MB)	Act Lvl	CPU Util	Number Tns	Average Response	Avg Per Second DB Fault	Pages	Non-DB Fault	Pages	Avg Per Minute Act-Wait	Wait-Inel	Act-Inel
01	0	612	0	5.7	0	.00	.0	.0	217.4	279.8	4,738	0	0
*02	3	9,346	652	61.9	0	.00	648.8	9999.9	1650.9	9999.9	520,910	8	0
03	3	1,113	279	1.6	0	.09	.0	2.1	2.2	5.3	22,214	0	0

```
| 04    3        61      10   .0          0     .00      .0     .0      .0     .0       0      0    0
| Total        11,134        69.3       51,810           648.8 13602.1 1870.6 12301.4 547,863    8    0
| Average                                         .09
```

* The pool did not exist for all of run, or the size or activity level
  changed during run.

```
| Pool ID              -- Pool identifier
| Expert Cache         -- Method used by the system to tune the storage pool
| Size (MB)            -- Size of the pool in Megabytes at the time of the first sample interval
| Act Lvl              -- Activity level at the time of the first sample interval
| CPU Util             -- Percentage of available CPU time used.  This is the average of all processors
| Number Tns           -- Number of transactions processed by jobs in this pool
| Average Response     -- Average transaction response time
| DB Fault             -- Average number of data base faults per second
| DB Pages             -- Average number of data base pages per second
| Non-DB Fault         -- Average number of non-data base faults per second
| Non-DB Pages         -- Average number of non-data base pages per second
| Act-Wait             -- Average number of active to wait job state transitions per minute
| Wait-Inel            -- Average number of wait to ineligible job state transitions per minute
| Act-Inel             -- Average number of active to ineligible job state transitions per minute
```

System Report - Disk Utilization

The Disk Utilization section of the System Report shows the utilization for each disk.

Changes to this section of the System Report include:

- The "ASP Rsc Name" and "ASP ID" columns have been removed.
- A label has been added at the beginning of each ASP/IASP section that indicates the ASP ID and ASP Rsc Name. The ASP Rsc Name is printed only when the DSASPN (ASP resource name) field in the QAPMDISK database file contains data.
- Totals and averages for each ASP/IASP section are printed at the end of each group of ASP/IASP.
- Totals and averages for all disk units are printed at the end of the Disk Utilization section, as before.

Example

```
                                        System Report                8/29/05 22:05:26
                                        Disk Utilization                 Page 0007
Member   . . . : Q241111929 Model/Serial  . : 595/02-0012A  Main storage . . : 26.0 GB  Started  . . : 08/29/05 11:19:29
  Library . . : QMPGDATA    System name . . : RCHAS64B       Version/Release  :  5/ 4.0  Stopped  . . : 08/29/05 12:07:00
Partition ID : 002          Feature Code  . : 7487-8966      Int Threshold  . : 100.00 %
Virtual Processors: 28      Processor Units : 11.0
          Unit               Size IOP  IOP        Dsk CPU --Percent-- Op Per   K Per   - Average Time Per I/O --
  Unit    Name        Type   (M)  Util Name       Util    Full Util  Second   I/O     Service  Wait   Response
  ----    ----------  ----  ------- ---- ----------  -------  ---- ----  -------- --------- -------  ------  --------
  ASP ID/ASP Rsc Name:  1/
  0001    DD084       6718  14,025   .1 CMB03         .0 73.2  1.4   6.44    11.2    .0021  .0003   .0024
  0002    DD085       6718  14,025   .1 CMB03         .0 73.2  1.6   5.79    10.5    .0027  .0003   .0030
  0003    DD106       6718  10,519   .1 CMB03         .0 73.2  1.2   6.49     9.9    .0018  .0001   .0019
  0004    DD089       6718  14,025   .1 CMB03         .0 73.2  1.4   6.17    11.3    .0022  .0002   .0024
  0005    DD074       6718  10,519   .1 CMB03         .0 73.2   .9   7.22     9.4    .0012  .0001   .0013
  0006    DD080       6718  14,025   .1 CMB03         .0 73.2  1.3   7.29    10.7    .0017  .0003   .0020
  0007    DD099       6718  10,519   .1 CMB03         .0 73.2  1.1   4.55    10.7    .0024  .0000   .0024
  0008    DD078       6718  10,519   .1 CMB03         .0 73.3  1.3   6.41    10.7    .0020  .0001   .0021
  0009    DD093       6718  14,025   .1 CMB03         .0 73.2  1.4   5.96    10.8    .0023  .0003   .0026
  0010    DD101       6718  10,519   .1 CMB03         .0 73.2  1.2   7.61     9.3    .0015  .0002   .0017
  0011    DD104       6718  14,025   .1 CMB03         .0 73.2  1.6   6.42    11.8    .0024  .0003   .0027
  0012    DD087       6718  14,025   .1 CMB03         .0 73.2  1.9   7.71    10.6    .0024  .0003   .0027
  0013    DD076       6718  10,519   .1 CMB03         .0 73.2  1.4   9.81     9.3    .0014  .0000   .0014
  0014    DD100       6718  10,519   .1 CMB03         .0 73.2  1.0   5.65    10.9    .0017  .0002   .0019
  0015    DD097       6718  14,025   .1 CMB03         .0 73.2  2.0   9.16    11.2    .0021  .0003   .0024
  0016    DD094       6718  14,025   .1 CMB03         .0 73.2  1.6   6.81    12.1    .0023  .0003   .0026
  0017    DD090       6718  10,519   .1 CMB03         .0 73.2  1.1   6.17     9.8    .0017  .0002   .0019
  0018    DD077       6718  10,519   .1 CMB03         .0 73.2  1.3   7.72    10.4    .0016  .0001   .0017
  0019    DD096       6718  14,025   .1 CMB03         .0 73.2  1.8   8.89    11.3    .0020  .0002   .0022
  0020    DD075       6718  10,519   .1 CMB03         .0 73.2  1.6   8.26    10.2    .0019  .0001   .0020
  0024    DD054       6717   8,589   .5 CMB07        4.1 73.2   .7   2.37    11.9    .0029  .0008   .0037
  0025    DD003       6717   6,442   .5 CMB07        4.3 74.0   .5   2.21    13.9    .0022  .0004   .0026
  0026    DD004       6717   8,589   .5 CMB07        4.3 73.5   .8   5.73    10.0    .0013  .0006   .0019
  0027    DD002       6717   6,442   .5 CMB07        4.4 75.0   .4   3.13     8.9    .0012  .0003   .0015
  0028    DD103       6717   8,589   .5 CMB07        4.2 73.2  1.0   5.14    10.1    .0019  .0012   .0031
  0029    DD020       6718  15,355  1.4 CMB05       10.0 73.2  4.5   9.48    11.2    .0047  .0038   .0085

Unit              -- Disk arm identifier
Unit Name         -- Disk arm resource name
Type              -- Type of disk
Size (M)          -- Disk space capacity in millions of bytes
IOP Util          -- Percentage of utilization for each Input/Output Processor
IOP Name          -- Input/Output Processor resource name
```

```
|  Dsk CPU Util            -- Percentage of Disk Processor Utilization
|  ASP Rsc Name            -- ASP resource name to which the disk unit was allocated at collection time
|  ASP ID                  -- Auxiliary Storage Pool ID
|  Percent Full            -- Percentage of disk space capacity in use
|  Percent Util            -- Average disk operation utilization (busy)
|  Op per Second           -- Average number of disk operations per second
|  K Per I/O               -- Average number of kilobytes (1024) transferred per disk operation
|  Average Service Time    -- Average disk service time per I/O operation
|  Average Wait Time       -- Average disk wait time per I/O operation
|  Average Response Time   -- Average disk response time per I/O operation
```

System Report - Communications Summary

The Communications Summary section of the System Report shows the use of the communications lines
and processors.

Example

Note: The line utilization in the sample system report shown does not correspond with the "Component
Report - IOP Utilizations" for an IOP running SDLC remote work stations. A low SDLC line
utilization value results in a high IOP utilization value due to polling. However, because the SDLC
line transfers a larger percentage of user data, an IOP polls less frequently. Usually this results in
an overall increase in IOP utilization. In some cases, though, especially when the SDLC lines have
a low utilization, this results in an overall decrease in IOP utilization. Thus, a high IOP utilization
value is significant only if at least one of the attached SDLC lines is active.

The values that display in the report header reflect the configuration metrics obtained from the
QAPMCONF file when the collection started. These values might change for each interval within a
collection period due to dynamic changes in logical partition configuration.

```
                                            System Report                              10/02/03 16:35:52
                                        Communications Summary                              Page 0009
                                    Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4 GB  Started  . . . . : 10/02/03 12:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release :   5/ 3.0   Stopped  . . . . : 10/02/03 16:00:00
Partition ID : 003       Feature Code  . : 7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:   4   Processor Units :   4.0
   IOP Name/                    Line     Avg    Max   Active    Number     Average   ------ KB Per Second -------
      Line         Protocol    Speed    Util   Util  Devices  Transactions  Response   Received      Transmitted
-------------------  --------  ---------  ----   ----  -------  ------------  --------  ----------    -----------
CMB02       (   )
  VGIBETH0           ELAN/F   1000000.0    0      0      0          0         .00         .0              .4
CMB07      (2843)
  AVALANCHE          ELAN/F     10000.0    0      0      0          0         .00         .0              .0
  DPNX25B            X25           64.0    0      0      0          0         .00         .0              .0
  DPNX25C            X25           64.0    0      0      0          0         .00         .0              .0
  NTRN64BA           TRLAN/H    16000.0    0      0      0          0         .00         .2              .0
CMB10      (2843)
  DPNX25             X25           64.0    0      0      0          0         .00         .0              .0
  DPNX25A            X25           64.0    0      0      0          0         .00         .0              .0
  TRNLIN64B2         TRLAN/H    16000.0    0      0      0          0         .00         .2              .0
CMB11      (2843)
  ETHLIN64B2         ELAN/F     10000.0    0      0      0          0         .00         .6              .0
  FAXLINT11          ASYNC        115.2    0      0      0          0         .00         .0              .0
  FAXLINT12          ASYNC        115.2    0      0      0          0         .00         .0              .0
  FAXLINT13          ASYNC        115.2    0      0      0          0         .00         .0              .0
  FAXLINT14          ASYNC        115.2    0      0      0          0         .00         .0              .0
  NETH64BA           ELAN/F   1000000.0    0      2      0          0         .00        18.9           116.0
IOP Name/Line         -- IOP Resource name and model number, Line ID
Protocol              -- Line protocol (SDLC, ASYNC, BSC, X25, TRLAN, ELAN, IDLC, DDI, FRLY, PPP)
                         If /H the protocol is half duplex, if /F it is full duplex
Line Speed            -- Line speed (1000 bits per second)
                         (For IDLC this is the maximum over the measurement)
Avg Util              -- Average line utilization
Max Util              -- Maximum line utilization in all measurement intervals
Active Devices        -- Average number of active devices on the line
Number Transactions   -- Number of transactions
Average Response      -- Average system response (service) time (seconds)
KB /Sec Received      -- Average number of kilobytes (1024 bytes) received per second
KB /Sec Transmitted   -- Average number of kilobytes (1024 bytes) transmitted per second
```

System Report - TCP/IP Summary

The TCP/IP Summary section of the System Report includes summary data at the TCP/IP interface level (line type and line description name).

The summary includes information such as packets sent and received. This information is useful when investigating the reason for transmission errors. The values in the unicast and non-unicast columns provide an indication as to where the problem resides. The problem can be related to transmissions sent to specific users (unicast) or in transmissions sent to many users (broadcast or multicast, which are instances of non-unicast transmissions).

Example

```
                                              System Report                                     100203   16:35:52
                                              TCP/IP Summary                                             Page 0010
                                       Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4 GB  Started  . . . . : 10/02/03 12:00:00
  Library . . : PTLIBV5R3  System name . . . : ABSYSTEM
Version/Release  :   5/ 3.0   Stopped  . . . . : 10/02/03 16:00:00
Partition ID  : 003      Feature Code  . : 7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
                 MTU       KB      ------------- Packets Received -------------        KB       ----------- Packets Sent -----------
Line Type/       Size    Received                              Number  Pct  Transmitted                                        Pct
  Line Name     (bytes)  /Second      Unicast      Non-Unicast  Error  Error  /Second      Unicast      Non-Unicast      Error
-----------   --------- ---------  ---------------  --------------- ------- ----- ----------  ---------------  --------------- -----
                 576
   *LOOPBACK               0         9,469              0         0   .00       0         9,469              0    .00
                 576
   *VIRTUALIP              0             0              0         0   .00       0             0              0    .00
X.25           1,024
   DPNX25                  0             0              0         0   .00       0             0              0    .00
ETHERNET       1,492
   AVALANCHE               0             0            142         0   .00       0             0             76    .00
ETHERNET       1,492
   NETH64BA              161     5,060,350         24,155         0   .00     249     5,564,439            481    .00
ETHERNET       1,492
   VGIBETH0                0             0              0         0   .00       0         4,315             76    .27
Line Type/Line Name    -- The type and name of the line description used by the interface.
MTU Size (bytes)       -- Maximum Transmission Unit (MTU) size in bytes for interface
KB Received/Second     -- Number of kilobytes (1024 bytes) received on interface per second
Unicast Packets Rcvd   -- Number of unicast packets received
Non-Unicast Packet Rcvd -- Number of non-unicast packets received
Num Packets Received Er -- Number of packets received that contained errors
Pct Packets Received Er -- Percentage of inbound packets that contained errors
KB Transmitted/Second  -- Number of kilobytes (1024 bytes) transmitted out of interface per second
Unicast Packets Sent   -- Number of unicast packets sent
Non-unicast Packet Sent -- Number of non-unicast packets sent
Pct Packets Sent Error -- Percentage of outbound packets that could not be sent because of errors
```

System Report - HTTP Server Summary

The HTTP Server Summary section of the System Report includes summary data at the server instance level for the IBM® HTTP Server (powered by Apache).

Changes to this section of the System Report include:

- The columns, "Non-SSL Inbound Connections," "SSL Inbound Connections," "Requests Received," and "Responses Sent" are shown in a rate of hits per second.
- The help text below the report section specifies that these metrics are shown in hits per second.

Example

```
                                              System Report                                     082905   22:05:26
                                           HTTP Server Summary                                           Page 0011
Member  . . . : Q241111929 Model/Serial  . : 595/02-0012A       Main storage . . :   26.0 GB  Started  . . . . : 08/29/05 11:19:29
  Library . . : QMPGDATA    System name . . . : RCHAS64B        Version/Release  :   5/ 4.0   Stopped  . . . . : 08/29/05 12:07:00
Partition ID  : 002       Feature Code  . : 7487-8966           Int Threshold  . : 100.00 %
Virtual Processors: 28    Processor Units :  11.0
                                                                --------------- Requests/Second ----------------
Server       Server job  Server job  Server start   ------- Threads -------  -- Inbound Connections --  Requests       Responses
name         user        number      date/time       Active        Idle      Non-SSL        SSL         received        sent
---------   ---------   ---------   --------------   ----------    ---------  -----------  -----------  -----------   ----------
```

```
KELLYMRA1   QTMHHTTP   834016    08/24/07 23:35        0        40      .00        .00        .00        .00
LAPCGI      QTMHHTTP   834019    08/24/07 23:35        0        40      .00        .00        .00        .00
Server name              -- The server job name.  Identify the child job for the server.
Server job user          -- The server job user.  Identify the child job for the server.
Server job number        -- The server job number.  Identify the child job for the server.
Server start date/time   -- The most recent start or restart time in format mm/dd/yy hh:mm:ss
Threads active           -- The number of threads doing work when the data was sampled.
Threads idle             -- The number of idle threads when the data was sampled.
Non-SSL Inbound Connect  -- The number of non-SSL inbound connections accepted by the server per second.
SSL Inbound Connections  -- The number of SSL inbound connections accepted by the server per second.
Requests received        -- The number of requests of all types received by the server per second.
Responses sent           -- The number of responses of all types sent by the server per second.
```

Performance Report header

Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

Report title
Identifies the type of performance report on the first line. The second line identifies the section of the report.

Current date and time
Indicates the date and time the report was printed.

Report page number
Identifies the page of the report.

Perf data from *time* **to** *time* **at** *interval*
Indicates the time period over which the data was collected and at what interval.

User-selected report title
Indicates the name assigned to the report by a user.

Member
Indicates the performance data member used in the report. This name corresponds to the name used on the MBR parameter of the Create Performance data (CRTPFRDTA) command.

Library
Identifies the library where the performance data used for a particular report is located.

Model/Serial
Indicates the model and serial number of the server on which the performance data for the report was collected. The serial number can be 10 characters.

Main storage size
Indicates the size of the main storage on the server on which the performance data was collected.

Started
Indicates the date and time Collection Services started collecting performance data for the report. Depending on whether or not you select specific intervals or a specific starting time, you could see the following:

- If you specify no intervals at which to run the report, the start date and time is the date and time at which the data was collected.

- If you specify specific intervals at which to run the report, the start date and time is the date and time at which the data was collected.

  Note: For the System Report only, you should consult the Report Selection Criteria section to find out which intervals were selected.

Stopped
The date and time Collection Services stopped collecting performance data for this report. Depending on whether or not you select specific intervals or a specific ending time, you could see the following:

- If you specify no intervals at which to run the report, the stop date and time is the date and time at which the data was collected.
- If you specify specific intervals at which to run the report, the stop date and time is the date and time at which the data was collected.

> **Note:** For the System Report only, you should consult the Report Selection Criteria section to find out which intervals were selected.

System name

Indicates the name of the server on which the performance data was collected for the report.

Version/Release level

x/ x.0 indicates which version and release level of the operating system the server was running at the time the performance data was collected.

Partition ID

Identifies the ID of the partition on which the collection was run. This change accommodates the logical partition implementation. Here are some of the values that you might see:

- If your system is not partitioned (which is the default) or you used Collection Services to collect and print the performance data for the primary partition of a logical partition system, this value is 00.
- If you collected data with the Start Performance Monitor (STRPFRMON) command in a previous release, the value for the partition ID is 00.
- If you used Collection Services to collect and print the performance data in any secondary partition of a logical partition system, this value is the same as the partition ID that is shown on the Work with System Partitions display under the Start Service Tools (STRSST) command.

Feature Code

Identifies the Interactive feature code value for the server.

Int Threshold

Indicates the percent of the total system CPU for interactive work that was used during the collection period. The value is obtained from the QAPMCONF file (GKEY IT) and reflects the configuration metric obtained when the collection started. You should be aware that this value may change for each interval within a collection period due to dynamic changes in logical partition configuration.

Virtual Processors

The number of virtual processors configured for the partition. The value is obtained from the QAPMCONF file (GKEY 13)and reflects the configuration metric obtained when the collection started. You should be aware that this value may change for each interval within a collection period due to dynamic changes in logical partition configuration.

Processor Units

The number of processor units allocated to the partition. The value is obtained from the QAPMCONF file (GKEY PU) and reflects the configuration metric obtained when the collection started. You should be aware that this value may change for each interval within a collection period due to dynamic changes in logical partition configuration.

Processing units are a unit of measure for shared processing power across one or more virtual processors. One shared processing unit on one virtual processor accomplishes approximately the same work as one dedicated processor. One shared processing unit on two virtual processors accomplishes approximately half the work of two dedicated processors.

Column headings

Each report also has several columns that make up the information of the report. Some are specific to a particular report and others are consistent between reports. For short descriptions of these columns, see the Performance Report columns page.

> **Related reference**

Example: Component Report

Related reference

Component Report - Component Interval Activity - all jobs

The Component Interval Activity - all jobs section of the Component Report shows the use of the processing unit, disks, and pools at various time intervals.

Changes to this section of the Component Report include:

- The "Pool Fault/Second User" column is expanded by 1 space.

Example

```
                                             Component Report                                    062304      1:2
                                    Component Interval Activity — all jobs                                   Page
                                             Capped at 5 Min interval
Member  . . . : Q051134916 Model/Serial   . : 840/10-3XHRM       Main storage . . : 6000.0  MB Started . . . . : 02/20/04 13:4
  Library . . : CAPPED       System name . . :RCHASPEZ            Version/Release  :   5/ 3.0 Stopped . . . . : 02/20/04 14:5
Partition ID  : 001          Feature Code  . :26D6-2461-1546      Int Threshold  . :  70.10 %
Virtual Processors:   9    Processor Units :   3.0
                                                        Int  Int  DB   ----- Disk I/O ------     High       Pool        Excp
  Itv      Tns      Rsp      DDM   -CPU Utilization-  Feat CPU  Cpb  ----- Per Second ---- -Utilization- -Faults/Sec-   per
  End     /Hour     /Tns     I/O   Total Inter Batch Util >Thld Util    Sync     Async   Disk   Unit Mch User  ID   Secon
  -----  -----------  -----  ----------  ----- ----- ----- ----- ----- ----- ---------- ---------- ----   ---- --- ---- -- -------
  13:55        0     .00       0   1.3   .0   1.3    .0     0   .0      16.9       6.5    1    0047  1    3   02     4
  14:00        0     .00       0   1.2   .0   1.2    .0     0   .0       4.6       3.3    1    0032  0    1   02     3
  14:05       95     .12       0   1.2   .0   1.2    .0     0   .0       4.7       2.5    1    0003  0    0   02     3
  14:10        0     .00       0   1.2   .0   1.2    .0     0   .0       3.5       1.4    1    0059  0    0   02     3

Itv End                -- Interval end time (hour and minute)
Tns /Hour              -- Number of interactive transactions per hour
Rsp /Tns               -- Average interactive transaction response time in seconds
DDM I/O                -- Number of logical DB I/O operations for DDM server jobs
Total CPU Utilization  -- Percentage of available CPU time used by interactive and batch jobs. This is the average
                          of all processors
Inter CPU Utilization  -- Percentage of available CPU time used by interactive jobs.  This is the average of all processors
Batch CPU Utilization  -- Percentage of available CPU time used by batch jobs. This is the average of all processors
```

```
| Int Feat Util          -- Percentage of interactive feature used by all jobs
| Int CPU >Thld          -- Interactive CPU time (in seconds) over threshold
| DB Cpb Util            -- Percentage of database capability used to perform database processing
| Sync Disk I/O Per Sec  -- Average synchronous disk I/O operations per second
| Async Disk I/O Per Sec -- Average asynchronous disk I/O operations per second
| High Disk Utilization  -- Percent of utilization of the most utilized disk arm during this interval
| High Utilization Unit  -- Disk arm which had the most utilization during this interval
| Mch Pool Faults/Sec    -- Average number of machine pool faults per second
| User Pool Faults/Sec   -- Average number of user pool page faults per second,
|                           for the user pool with highest fault rate during this interval
| Pool ID                -- User pool that had the highest page fault rate
| Excp per second        -- Number of program exceptions that occurred per second
```

Component Report - Job Workload Activity

The Job Workload Activity section of the Component Report gives the total number of transactions, the transactions per hour, the average response time, the number of disk operations, the number of communications operations, the number of PAG faults, the number of arithmetic overflows, and the number of permanent writes for each job.

The values that display in the report header reflect the configuration metrics obtained from the QAPMCONF file when the collection started. These values might change for each interval within a collection period due to dynamic changes in logical partition configuration.

Example

```
                                    Component Report                              10/02/03 17:12:15
                                   Job Workload Activity                              Page    6
                               Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4  GB Started . . . . :  10/02/03 14:00:00
  Library . . : PTLIBV5R3   System name . . :ABSYSTEM
Version/Release :   5/ 3.0  Stopped . . . . :  10/02/03 16:00:00
Partition ID : 003       Feature Code  . :7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors: 4    Processor Units :   4.0
                               T    P        DB
    Job      User Name/ Job   y    t   CPU  Cpb            Tns          -------- Disk I/O --------  Cmn    PAG  Arith Perm
   Name      Thread     Number p  Pl y  Util Util   Tns   /Hour   Rsp    Sync   Async  Logical     I/O   Fault Ovrflw Write
---------- ---------- ------ -- -- -- ---- ---- ------- --------- ------- -------- -------- -------- ------- ----- ------ ------
ADMIN      QTMHHTTP   955725 B  02 25  .02   .0      0        0   .000   14771     615       0       0     0      0   2787
ADMIN      QTMHHTTP   955727 B  02 25  .00   .0      0        0   .000      24       0       0       0     0      0      2
ADMIN      QTMHHTTP   955728 B  02 25  .00   .0      0        0   .000       0       0     165       0     0      0      0
ADMIN      QTMHHTTP   956347 B  02 25  .14   .0      0        0   .000     959     343    1349       0     0      0    736
AMQALMPX   QMQM       955751 B  02 35  .00   .0      0        0   .000       0       0       0       0     0      0      0
AMQPCSEA   QMQM       955757 B  02 35  .00   .0      0        0   .000       0       0       0       0     0      0      0
AMQRMPPA   QMQM       955773 B  02 35  .01   .0      0        0   .000      14       0       2       0     0      0      0
AMQRRMFA   QMQM       955752 B  02 35  .00   .0      0        0   .000       1       0       0       0     0      0      0
AMQZDMAA   QMQM       955753 B  02 35  .00   .0      0        0   .000       0       0       0       0     0      0      0
AMQZLAA0   QMQM       955755 B  02 20  .02   .0      0        0   .000       7       0       0       0     0      0      0
AMQZLAA0   QMQM       955774 B  02 20  .00   .0      0        0   .000       2       0       0       0     0      0      0
AMQZXMA0   QMQM       955749 B  02 20  .00   .0      0        0   .000       1       0       0       0     0      0      0
CFINT01               L  01 00  .26   .0      0        0   .000       0       0       0       0     0      0      0
CFINT02               L  01 00  .06   .0      0        0   .000       0       0       0       0     0      0      0
CFINT03               L  01 00  .08   .0      0        0   .000       0       0       0       0     0      0      0
CFINT04               L  01 00  .08   .0      0        0   .000       0       0       0       0     0      0      0
CFINT05               L  01 00  .00   .0      0        0   .000       0       0       0       0     0      0      0
CFINT06               L  01 00  .00   .0      0        0   .000       0       0       0       0     0      0      0
COLDQT                L  01 82  .00   .0      0        0   .000       0       0       0       0     0      0      0
CPUTEST    WLCPU      953645 B  02 51  .00   .0      0        0   .000       0       0       0       0     0      0      0
CPUTEST    WLCPU      953647 B  02 51  .00   .0      0        0   .000       0       0       0       0     0      0      0
CPUTEST    WLCPU      953648 B  02 51  .00   .0      0        0   .000       0       0       0       0     0      0      0
CPUTEST    WLCPU      953649 B  02 51  .00   .0      0        0   .000       0       0       0       0     0      0      0
CPUTEST    WLCPU      953650 B  02 51  .00   .0      0        0   .000       0       0       0       0     0      0      0
Job Name          -- Job name
User Name/Thread  -- User name or secondary thread identifier
Job Number        -- Job number
Typ               -- Job type
Pl                -- Pool that the job ran in
Pty               -- Priority of the job
CPU Util          -- Percentage of available CPU time used by the job.  This is the average of all processors
DB Cpb Util       -- Percentage of database capability used by the job to perform database processing
Tns               -- Total number of transactions for the job
Tns /Hour         -- Transactions per hour
Rsp               -- Average interactive transaction response time in seconds
Sync Disk I/O     -- Number of synchronous disk operations (reads and writes)
Async Disk I/O    -- Number of asynchronous disk operations (reads and writes)
Logical Disk I/O  -- Number of logical disk operations (Get, Put, Upd, Other)
```

```
Cmn I/O              --  Number of communications operations (Get, Put)
PAG Fault            --  Number of faults involving the Process Access Group
Arith Ovrflw         --  Number of arithmetic overflow exceptions
Perm Write           --  Number of permanent writes
.
.
.
Column                       Total              Average
           --------------------------  ----------------    ----------------
           CPU Util                                         98.740 *
           DB Cpb Util                                      82.3
           Tns                          2,099
           Tns /Hour                    1,043
           Resp                                             1.610
           Sync Disk I/O                  304,001
           Async Disk I/O               1,906,898
           Logical Disk I/O             6,257,174
           Cmn I/O                              0
           PAG Fault                            0
           Arith Ovrflw                         3
           Perm Write                   1,980,564
           * ----  Average based on the total elapsed time for the selected intervals
```

Component Report - Storage Pool Activity

The Storage Pool Activity section of the Component Report shows detailed information for each storage pool. This information includes the storage pool activity level, as well as the number of transactions processed in each pool.

The Pool Identifier, shown at the top of the Storage Pool Activity section, specifies the storage pool identifier (the value can be from 01 through 64). A separate Storage Pool Activity section exists for each pool that was in use during the measurement period and was selected on the Print Component Report (PRTCPTRPT) command.

Changes to the Storage Pool Activity section of the Component Report include:

• The values under the Pool Size column are now expressed in megabytes.

Example

```
                                        Component Report                              5/27/04 10:53:08
                                      Storage Pool Activity                                  Page 1219
          Pool                        Avg                 ---------- Avg Per Second ----------    ----- Avg Per Minute -----
  Itv     Size     Act    Total       Rsp      CPU     ------ DB ------  ----- Non-DB -----   Act-    Wait-    Act-
  End     (MB)     Level  Tns         Time     Util    Faults   Pages    Faults   Pages       Wait    Inel     Inel
  -----  -----------  -----  -----------  -----    -----   -------  ------   -------  ------      ------  ------   ------
  10:16   9,346     2332          0     .00      73.5     71.2    13002    1188.6   12081       127748       0        0
  10:17   9,346     2332          0     .00      73.3     84.0    10130    1120.7   12352        93827       0        0
Itv End            --  Interval end time (hour and minute)
Pool Size (MB)     --  Initial pool size in Megabytes (1024)
Act Level          --  Initial pool activity level
Total Tns          --  Number of transactions processed in this pool
Avg Resp Time      --  Average transaction response time
CPU Util           --  Percentage of available CPU time used by the job.  This is the average of all processors
DB Faults          --  Database faults per second
DB Pages           --  Database pages per second
Non-DB Faults      --  Nondatabase faults per second
Non-DB Pages       --  Nondatabase pages per second
Act-Wait           --  Number of active-to-wait transitions per minute
Wait-Inel          --  Number of wait-to-ineligible transitions per minute
Act-Inel           --  Number of active-to-ineligible transitions per minute
```

Component Report - Disk Activity

The Disk Activity section of the component report shows the average disk activity per hour and the disk capacity for each disk.

The values that display in the report header reflect the configuration metrics obtained from the QAPMCONF file when the collection started. These values might change for each interval within a collection period due to dynamic changes in logical partition configuration.

Note: A plus sign (+) displays next to the Unit column to identify multipath disk units. A multipath disk unit is a unit that has multiple redundant paths from the system to the disk unit.

Example

```
                                           Component Report                          10/03/03 13:54:29
                                              Disk Activity                          Page      1
                                          Multipath disk data
Member . . . : Q119115948 Model/Serial  . : 840/10-3A6HM
Main storage . . : 1024.0  GB Started . . . . :  04/29/03 11:59:48
  Library . . : MPLIB        System name . . :ABSYSTEM
Version/Release :    5/ 3.0  Stopped . . . . :  04/30/03 00:00:00
Partition ID  : 001        Feature Code  . :23FE-2420-1546
Int Threshold  . :  10.00 %
Virtual Processors:  4    Processor Units :   4.0
           ---------- Average Disk Activity Per Hour ----------- ------ Cache hit Statistics ----- %Write
           Srv -------------- Disk Arm Seek Distance --------------- Device Controller Write EACS EACS  Cache   -Disk Capacity-
  Unit  Util Time     0     1/12    1/6     1/3     2/3    >2/3  Read    Read   Effic Read Resp Overruns   MB    Percent
  ----  ---- ----  -------- ------- ------- ------- ------- ------- ------ -------- ----- ---- ---- -------- ------- ------
  0001  .1 .0346     516     564       8     111       0       0  23.0    25.6   86.1  .0   .0     .0     5,164   60.1
  0002  .0 .0000      67     397      43      76       0       0  30.9    63.4   80.8  .0   .0     .0     5,463   63.6
  0003  .1 .0189     228     388      96      93      10       6  38.9    57.1   81.2  .0   .0     .0     5,463   63.6
+ 0004  .0 .0000       0       0       0       0       0       0   .0      .0     .0   .0   .0     .0     8,586   99.9
+ 0005  .0 .0000       0       0       0       0       0       0   .0      .0     .0   .0   .0     .0     8,586   99.9
+ Multipath disk unit
        Column                       Total           Average
      --------------------------    ---------------    ----------------
        Util                                                 .0
        Srv Time                                             .0000
        Disk Arm Seek Distance
          0                            813
          1/12                       1,350
          1/6                          148
          1/3                          281
          2/3                           10
          >2/3                           6
        Cache hit Statistics
          Device Read                                      27.7
          Controller Read                                  43.4
          Write Efficiency                                 82.4
          EACS Read                                          .0
          EACS Resp                                          .0
        %Write Cache Overruns                                .0
        Disk Capacity
          MB                        67,606
          Percent                                          87.4
Unit                 --  Disk arm identifier
Util                 --  Drive utilization
Srv Time             --  Average service time per request in seconds
Disk Arm Seek Distance  --  Average seek distance distributions per hour
  0                  --  Number of zero seeks
  1/12               --  Number of seeks between 0 and 1/12 of the disk
  1/6                --  Number of seeks between 1/12 and 1/6 of the disk
  1/3                --  Number of seeks between 1/6 and 1/3 of the disk
  2/3                --  Number of seeks between 1/3 and 2/3 of the disk
  >2/3               --  Number of seeks greater than 2/3 of the disk
Cache hit Statistics --
  Device Read        --  Percent of device read hits for each arm
  Controller Read    --  Percent of controller cache read hits for each arm
  Write Efficiency   --  Percent of efficiency of write cache
  EACS Read          --  Extended Adaptive Cache Simulator percent read hits
  EACS Resp          --  Extended Adaptive Cache Simulator estimated percent response time improvement
%Write Cache Overruns --  Percent of Write Cache Overruns
Disk Capacity        --  Average amount of disk space used or available
  MB                 --  Millions of bytes available on the disk
  Percent            --  Percent of space available on the disk
```

Component Report - Input/Output Processor (IOP) Utilizations

The Input/Output Processor (IOP) Utilizations section of the Component report shows the input/output processor (IOP) utilization for communications, direct access storage devices (DASDs), multifunction (DASD, communication, and local work stations). Consistent utilization, at or above the threshold value of the DASD IOP and multifunction IOP, will affect system performance and cause longer response times or less throughput.

See the utilization guidelines and thresholds in the Performance Tools book for a list of threshold values.

Example

Note: The total for the I/O processor utilization often times does not match the sum of the three columns (IOP Processor Util Comm, IOP Processor Util LWSC, and IOP Processor Util DASD). This mismatch is caused by the utilization of other small components, such as system time.

```
                                     Component Report                              10/02/03 17:12:15
                                      IOP Utilizations                                     Page  345
                                Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4  GB Started . . . . :  10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release  :    5/ 3.0  Stopped . . . . :  10/02/03 16:00:00
Partition ID  : 003      Feature Code  . :7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
                          --- IOP Processor Util ---   DASD    -- KBytes Transmitted --   Available
IOP                       Total  Comm  LWSC  DASD   Ops/Sec      IOP        System       Storage     Util 2
-------------------       -----  ----- ----- -----  ----------- ----------- -----------  -----------  ------
CMB05      (2843)          .4    .0    .0    .0                     54          0        65,038,208    .0
CMB06      (2843)          .0    .0    .0    .0                     72          0        63,717,218    .0
CMB07      (2843)          .5    .2    .0    .1                    488          0        53,520,379    .0
CMB08      (2843)         3.2    .0    .0   1.9                  1,314          0        61,607,496    .0
CMB09      (2843)          .3    .0    .0    .1                    249          0        61,645,950    .0
CMB10      (2843)          .3    .2    .0    .0                  6,885        256        55,139,610    .0
CMB11      (2843)         1.9   1.6    .0    .0                147,424          0        53,390,615    .0
IOP                            --  Resource name and model number for each communications, DASD,
                                   multifunction, and local work station IOP
IOP Processor Util Total       --  Total utilization for IOP
IOP Processor Util Comm        --  Utilization of IOP due to communications activity
IOP Processor Util LWSC        --  Utilization of IOP due to local work station activity
IOP Processor Util DASD        --  Utilization of IOP due to DASD activity
DASD Ops/Sec                   --  Disk operations per second
KBytes Transmitted IOP         --  Total Kbytes transmitted from an IOP to the system across the bus
KBytes Transmitted System      --  Total Kbytes transmitted to the IOP from the system across the bus
Available Storage              --  The average number of bytes of free local storage in the IOP
Util 2                         --  Utilization of co-processor
```

Related information

Performance Tools PDF

Component Report - Local Work Stations

The Local Work Stations - Response Time Buckets section of the Component Report gives the utilization of each controller, the range of response times for each device, and the average response time for each device. The values for the response times may vary depending on the values you use.

Example

```
                                     Component Report                              10/02/03 17:12:15
                            Local Work Stations - Response Time Buckets                    Page  346
                                Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4  GB Started . . . . :  10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . :ABSYSTEM
Version/Release  :    5/ 3.0  Stopped . . . . :  10/02/03 16:00:00
Partition ID  : 003      Feature Code  . :7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
  Ctl/Device      Util    IOP Name
--------------    ----    -----------                  .0
                                             0- .0      .0- .0    .0- .0     .0- .0     > .0     Rsp Time
                                             ------    --------- --------- --------- ------   --------
Total Responses                               0           0         0         0         0      .00
Ctl                            --  Controller identifier
Device                         --  Device identifier
Util                           --  Controller utilization
IOP Name                       --  Input/Output processor resource name
0- .0                          --  Number of response times in this range
 .0-  .0                       --  Number of response times in this range
 .0-  .0                       --  Number of response times in this range
 .0-  .0                       --  Number of response times in this range
> .0                           --  Number of response times in this range
Rsp time                       --  Average external response time (in seconds)
                                   for this workstation(s)
```

Component Report - Remote Work Stations

The Remote Work Stations section of the component report shows the range of response times for each device on the displayed controllers and the average response time for each device. The values for the response times may vary depending on the values you use.

Note: This section appears only if 5494 remote work station data is included in the data collection. Collection Services does not generate data for remote work stations (file QAPMRWS). This section applies only to performance data generated by the Start Performance Monitor (STRPFRMON) command prior to V5R1 and converted in V5R1 with the Convert Performance Data (CVTPFRDTA) command.

Example

```
                                     Component Report                              9/24/98  7:38:05
                           Remote Work Stations - Response Time Buckets                 Page   18
                                    Sample Component Report
Member . . . : TEST20     Model/Serial  . : 500-2142/10-317CD
Main storage . . : 128.0  M Started . . . . : 09/19/98 16:47:34
  Library . . : RWSDATA    System name . . :ABSYSTEM
Version/Release :   4/ 2.0         Stopped . . . . : 09/19/98
17:12:36
  Ctl/Device            IOP Name
---------------         -----------
ABSYSTEM                CC02
                              0- 1.0     1.0- 2.0    2.0- 4.0    4.0- 8.0    > 8.0    Rsp Time
                              ------     ---------   ---------   ---------   ------   --------
    RCH5DSP07                    845           0           0           0        0       .02
Total Responses                  845           0           0           0        0       .02
Ctl                -- Controller identifier
Device             -- Device identifier
IOP Name           -- Input/Output processor resource name
0- 1.0             -- Number of response times in this range
 1.0- 2.0          -- Number of response times in this range
 2.0- 4.0          -- Number of response times in this range
 4.0- 8.0          -- Number of response times in this range
> 8.0              -- Number of response times in this range
Rsp time           -- Average external response time (in seconds)
                      for this workstation(s)
```

Component Report - Exception Occurrence Summary and Interval Counts

The Exception Occurrence Summary and Interval Counts section of the component report shows the number of exceptions that occurred and the frequency of these exceptions. In some cases these exception counts can be high even under normal system operation.

Example

```
                                     Component Report                             10/02/03 17:12:15
                        Exception Occurrence Summary and Interval Counts               Page  347
                              Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4  GB Started . . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . :ABSYSTEM
Version/Release :   5/ 3.0  Stopped . . . . : 10/02/03 16:00:00
Partition ID  : 003       Feature Code  . :7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:   4   Processor Units :   4.0
                               Exception Counts
        Exception
          Type                 Description               Total
     ---------------    ------------------------------   ----------
     Size              Size                                   3
     Binary Overflow   Binary overflow                        0
     Decimal Overflow  Decimal overflow                       3
     Flp Overflow      Floating point overflow                0
     Decimal Data      Decimal data                           0
     Aut Lookup        Authority lookup                  37,687
     PAG Fault         Process Access Group fault             0
     Seize Conflict    Seize conflict                   194,854
     Lock Conflict     Lock conflict                      1,504
     Verify            Verify                            20,097
     Teraspace EAO     Teraspace Effective Address Overflow 9,781
     -------------------------------------- Exceptions Per Second ---------------------------------
```

Itv End	Size	Binary Overflow	Decimal Overflow	Flp Overflow	Decimal Data	Aut Lookup	PAG Fault	Seize Conflict	Lock Conflict	Verify	Teraspace EAO
14:00	.0	.0	.0	.0	.0	3.0	.0	4.0	.1	.2	1.2
14:01	.0	.0	.0	.0	.0	7.1	.0	3.8	.0	.1	.4
14:02	.0	.0	.0	.0	.0	4.7	.0	10.8	.2	.0	2.9
14:03	.0	.0	.0	.0	.0	5.2	.0	9.8	.1	1.3	.0
14:04	.0	.0	.0	.0	.0	2.8	.0	3.9	.2	4.8	3.3
14:05	.0	.0	.0	.0	.0	8.2	.0	4.6	.2	1.5	.0
14:06	.0	.0	.0	.0	.0	18.1	.0	3.1	.1	2.0	3.3
14:07	.0	.0	.0	.0	.0	27.3	.0	9.3	.0	1.6	.2
14:08	.0	.0	.0	.0	.0	19.6	.0	4.1	.0	.9	2.8
14:09	.0	.0	.0	.0	.0	32.9	.0	16.9	2.2	12.2	.6
14:10	.0	.0	.0	.0	.0	28.3	.0	35.5	.5	2.8	2.1
14:11	.0	.0	.0	.0	.0	28.6	.0	50.7	.0	1.7	1.2
14:12	.0	.0	.0	.0	.0	25.9	.0	28.2	.1	1.2	.8
14:13	.0	.0	.0	.0	.0	29.8	.0	42.1	.1	1.8	2.4
14:14	.0	.0	.0	.0	.0	7.9	.0	68.0	4.7	.5	.3
14:15	.0	.0	.0	.0	.0	4.5	.0	99.1	.9	.4	2.9
14:16	.0	.0	.0	.0	.0	2.7	.0	66.6	.0	109.1	.0
14:17	.0	.0	.0	.0	.0	2.7	.0	40.3	.0	149.2	2.3
14:18	.0	.0	.0	.0	.0	1.7	.0	38.6	.0	.7	1.0
14:19	.0	.0	.0	.0	.0	1.2	.0	4.7	.0	.2	.5
14:20	.0	.0	.0	.0	.0	.9	.0	4.8	.0	.2	.0
14:21	.0	.0	.0	.0	.0	2.4	.0	2.0	.2	1.5	2.5
14:22	.0	.0	.0	.0	.0	5.4	.0	18.3	.0	.2	.7
14:23	.0	.0	.0	.0	.0	2.4	.0	25.5	.0	.1	.0

Component Report - Database Journaling Summary

The Database Journaling Summary section of the Component report provides information about the journal activity on the system.

This information is helpful in understanding the trade-offs between the following:

- The affects of extensive journaling.
- The time required to rebuild access paths during an IPL following an abnormal system end.

The Database Journaling section summarizes the journaling activity resulting from user-initiated activities and from system-managed access-path protection (SMAPP) support. This includes the following information:

- The number of start and stop journaling operations performed.
- The number of journal entry deposits made on behalf of objects for which a user started journaling.
- The number of journal entry deposits made on behalf of objects for which the system started journaling.

The Extended Database Journaling Summary subsection shows information about counters in the QAPMJOBMI file during the specified collection interval.

Example

```
                                    Component Report                              10/02/03 17:12:15
                                 Database Journaling Summary                            Page 351
                               Perf data from 14:00 o 16:00 at 1 min
Member  . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4  GB Started . . . . :  10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . :ABSYSTEM
Version/Release :   5/ 3.0  Stopped . . . . :  10/02/03 16:00:00
Partition ID : 003       Feature Code  . :7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:    4    Processor Units :   4.0
```

Itv End	Journal Operations				Journal Deposits			Bundle Writes User	Bundle Writes System	Exposed AP		Est Exposr		SMAPP ReTune
	User Starts	User Stops	System Starts	System Stops	User Total	System Total	System ToUser			System Jrnld	Not Jrnld	Curr System	AP Not Jrnld	
14:00	0	0	0	0	1143	179	168	176	0	6	52	57	4,372	0
14:01	11	1	0	0	1757	251	54	355	64	6	51	39	4,309	0
14:02	8	0	0	0	2418	217	57	426	52	9	57	57	6,193	0
14:03	1	1	0	0	2726	136	130	549	0	6	54	39	4,310	0
14:04	0	0	0	0	2346	425	353	325	20	10	57	57	6,799	0
14:05	6	0	0	0	534	197	6	67	56	10	57	57	6,799	0
14:06	3	2	2	0	579	231	60	98	38	8	52	27	4,310	1
14:07	7	0	0	0	1635	511	156	252	80	8	55	37	4,373	0

```
14:08     0      0      0      0    1161    252     70    233     28      8     55     27   4,310      0
14:09     8      1      0      0    3425    682    152    641    141     12     47     27   6,736      0
14:10     4      0      0      0    3861    329     73    697     42     12     50     37   6,799      0
14:11     1      0      0      0    5626    359    106   1017     42      8     50     37   4,373      1
14:12     0      1      0      0    3718    282     50    680     42     12     50     37   6,799      0
14:13     0      0      0      0    5590    296     59    980     44      8     47     27   4,310      0
14:14     0      0      0      0    4581    168    122    914     10      8     47     27   4,310      0
14:15     1      1      0      0    3320    162    161    549      0     12     50     37   6,799      0
14:16     0      0      0      0    5741     33     28   1743      0     12     64     37   6,800      0
14:17     1      1      0      0    6735     22     16   2565      0      8     50     27   4,310      0
```

Itv End   -- Interval end time (hour and minute)
User Starts   -- Start journal operations initiated by user
User Stops   -- Stop journal operations initiated by user
System Starts   -- Start journal operations initiated by system
System Stops   -- Stop journal operations initiated by system
User Total   -- Journal deposits resulting from user journaled
                          objects
System Total   -- Journal deposits resulting from system journaled
                          objects (total)
System ToUser   -- Journal deposits resulting from system journaled
                          objects to user created journals
Bundle Writes User   -- Bundle writes to user created journals
Bundle Writes System   -- Bundle writes to internal system journals
Exposed AP System Jrnld -- Exposed access paths currently being journaled
                          by the system
Exposed AP Not Jrnld   -- Exposed access paths currently not being journaled
Est Exposr Curr System -- System estimated access path recovery time
                          exposure in minutes
Est Exposr AP Not Jrnld -- System estimated access path recovery time
                          exposure in minutes if no access
                          paths were being journaled by the system
SMAPP ReTune   -- System Managed Access Path Protection tuning
                          adjustments
.
.
.

                                  Component Report   10/02/03 17:12:15
                            Extended Database Journaling Summary   Page 355
                            Perf data from 14:00 to 16:00 at 1 min
Member   . . . : Q275140000 Model/Serial . : 890/10-3907F
Main storage . . :   56.4 GB Started . . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3 System name . . :ABSYSTEM
Version/Release :   5/ 3.0 Stopped . . . . : 10/02/03 16:00:00
Partition ID : 003   Feature Code . :7427-2498-7427
Int Threshold . :   .00 %
Virtual Processors: 4   Processor Units :   4.0

| Itv End | --------- Journal Operations -------- | | | ---------- Journal Deposits --------- | | | Perm Size | Transient Size | Bundle Wait Pct | Bundle Wait Count |
	Commit Ops	Decommit Ops	Physical Writes	Non SMAPP	SMAPP User	SMAPP System				
14:00	316	0	292	1142	168	11	5843	7971	.00	157
14:01	382	0	452	1757	54	197	4054	3120	.00	427
14:02	546	1	515	2418	57	160	5050	3436	.00	531
14:03	655	0	637	2726	130	6	7143	6626	.00	575
14:04	643	2	577	2346	353	72	8488	17153	.00	361
14:05	68	0	127	542	6	191	2872	719	.00	112
14:06	123	0	177	579	60	171	2656	2552	.00	127

Itv End   -- Interval end time (hour and minute)
Commit Ops   -- Commit operations performed. Includes application
                       and system-provided referential integrity commits
Decommit Ops   -- Decommit operations performed. Includes
                       application and system-provided referential
                       integrity decommits
Physical Writes   -- Physical journal write operations to disk
Non SMAPP   -- Journal deposits not directly related to SMAPP
                       (System Managed Access Path Protection)
SMAPP User   -- SMAPP-induced journal entries deposited in
                       user-provided journals
SMAPP System   -- SMAPP-induced journal entries deposited in
                       system-provided (default) journals
Perm Size   -- Kilobytes placed within the permanent area; these
                       are traditional journal entries which
                       can be retrieved and displayed
Transient Size   -- Kilobytes placed within the journal transient area;
                       these are hidden journal entries produced by the
                       system
Bundle Wait Pct   -- Percentage of time (relative to the interval elapsed
                       time) spent waiting for journal bundles to be
                       written to disk
Bundle Wait Count   -- Total number of times the tasks and jobs waited for
                       journal bundles to be written to disk

Related information

Performance Tools PDF
Performance data files: QAPMJOBMI

Component Report - TCP/IP Activity

The TCP/IP Activity section of the Component report includes detailed TCP/IP data at both the
system-wide level and the interface (line type and line name) level.

Example

```
                                         Component Report                                10/02/03 17:12:15
                                          TCP/IP Activity                                      Page  364
                                    Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4 GB  Started . . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . :ABSYSTEM
Version/Release :    5/ 3.0  Stopped . . . . : 10/02/03 16:00:00
Partition ID  : 003        Feature Code  . :7427-2498-7427
Int Threshold . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
System TCP/IP
      ----- Datagrams -----  Datagrams Requested  --- TCP Segments ----  ------- UDP Datagrams -------  ------- ICMP Messages ------
   Itv                   Pct  - for Transmission --  - per Second --  Pct                          Pct                          Pct
   End     Received     Error    Total    Dscrd  Rcvd    Sent   Rtrns  Received     Sent    Error  Received     Sent     Error
   -----  ---------------  -----  ---------------  -----  -------  -------  -----  ----------  -----------  -----  ----------  -----------  -----
   14:00       9,755     .00        8,908    .00    153    146    .39       382          49    .00         2           2    .00
   14:01      11,188     .00       10,750    .00    157    177    .47       386          37    .00         3           3    .00
   14:02      22,187     .00       21,196    .00    332    351    .19       417          37    .00         3           3    .00
   14:03      19,193     .00       19,454    .00    292    322    .20       375          42    .00         2           2    .00
   14:04      12,916     .00       12,394    .00    208    207    .40       390          41    .00         4           4    .00
   14:05      10,059     .00        9,451    .00    156    155    .21       394          54    .00         3           3    .00
   14:06       7,721     .00        7,213    .00    118    118    .36       388          46    .00         3           3    .00
   14:07      11,453     .00       10,726    .00    160    160    .29       342          38    .00         2           2    .00
   14:08      12,864     .00       12,269    .00    194    202    .23       363          40    .00         3           3    .00
   14:09      20,454     .00       19,601    .00    295    324    .21       421          40    .00         4           4    .00
   14:10      28,464     .00       28,480    .00    423    480    .09       366          38    .00         2           2    .00
   14:11      35,731     .00       42,567    .00    585    707    .05       376          37    .00         4           4    .00
   14:12      24,847     .00       29,474    .00    404    488    .06       392          63    .00         3           6  33.33
   14:13      42,389     .00       49,140    .00    697    816    .08       389          42    .00         3           3    .00
   14:14      30,610     .00       35,663    .00    499    592    .07       416          39    .00         4           4    .00
   14:15      25,407     .00       28,439    .00    414    471    .11       381          54    .00         2           2    .00
   14:16      37,219     .00       43,619    .00    610    724    .06       407          46    .00         3           3    .00
   14:17      36,745     .00       43,607    .00    612    737    .04       379          37    .00         2           2    .00
   14:18      37,220     .00       42,089    .00    611    699    .07       362          38    .00         3           3    .00
   14:19      13,700     .00       13,665    .00    218    225    .42       373          38    .00         4           4    .00
   14:20      11,114     .00       10,598    .00    175    174    .42       388          36    .00         3           3    .00
   14:21       9,506     .00        8,554    .00    148    139    .72       380          40    .00         3           3    .00
   14:22      31,988     .00       35,480    .00    489    589    .08       517          46    .00         3           3    .00
   14:23      28,038     .00       31,956    .00    462    540    .04       484          41    .00         2           2    .00
   14:24      20,085     .00       21,541    .00    323    356    .21       383          58    .00         3           3    .00
Itv End                  --  Interval end time (hour and minute)
Datagrams Received       --  Total number of datagrams received
Pct Datagrams Error      --  Percentage of inbound datagrams with errors
Dtgm Req for Transm Tot  --  Total number of datagrams requested for transmission
Dtgm Req Transm Dscrd    --  Percentage of datagrams discarded because of errors
Segments Rcvd per Sec    --  Number of TCP segments received per second
Segments Sent per Sec    --  Number of TCP segments sent per second
Segments Pct Retrans     --  Percentage of TCP segments retransmitted relative to segments sent
UDP Datagrams Received   --  Total number of datagrams delivered to UDP users
UDP Datagrams Sent       --  Total number of UDP datagrams sent
Pct UDP Datagrams Error  --  Percentage of UDP datagrams (inbound and outbound) with errors
ICMP Messages Received   --  Total number of ICMP messages received
ICMP Messages Sent       --  Total number of ICMP messages sent
Pct ICMP Messages Error  --  Percentage of ICMP messages (inbound and outbound) with errors
```

Component Report - HTTP Server Activity

The HTTP Server Activity section of the Component report includes detailed information about various
HTTP Server request types such as, CGI, WebSphere®, or Proxy requests.

Changes to this section of the Component Report include:

- A new column "Hits/Second" has been added to this report.
- A row that contains the average requests in hits per second has been added to the Total subsection of
  this report.
- The help text below this section describes the new column.

Example

```
                                     Component Report                         10/02/03 17:12:15
                                     HTTP Server Activity                            Page   389
                                Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage . . :   56.4 GB  Started . . . . :  10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . :ABSYSTEM
Version/Release  :    5/ 3.0  Stopped . . . . :  10/02/03 16:00:00
Partition ID  : 003        Feature Code  . :7427-2498-7427
Int Threshold  . :    .00 %
Virtual Processors:  4    Processor Units :   4.0
Server : 955725/QTMHHTTP/ADMIN
                             -------- Responses ---------         KB           KB
    Itv   Req   Requests                          Pct    Transmitted    Received       Hits
    End   type  Received      Sent      Error    Error    /Second       /Second       /Second
   -----  ----  ----------  ----------  -------  ------  ------------  ------------  ----------
   11:30  SR          34          34         0    .00             0             0        0.03
   11:30  CG           3           3         0    .00             0             0        0.00
   11:30  JV          37          37         0    .00             0             0        0.04
         Column                            Total           Average
   ------------------------------    ---------------    ---------------
         Requests Received                   74
         Responses Sent                      74
         Responses in error                   0
         Pct Responses in error                             .000
         KB Transmitted/Second                                 0
         KB Received/Second                                    0
         Hits/Second                                         .021
```

Component Report - Selection Criteria

The Selection Criteria section of the Component report shows the selection values you chose to produce the report.

If you did not use the SELECT parameters, the message No Select parameters were chosen appears. If you did not use OMIT parameters, the message No Omit parameters were chosen appears. In addition to these selection criteria, you also see the following:

- Which sections were printed
- Which sections were not printed or were partially printed due to errors
- Which sections were not printed or were partially printed due to missing data.

Example: Select Parameters

```
                                     Component Report                         2/22/01 10:43:05
                                  Report Selection Criteria                          Page    16
Member  . . . : PT51MBR15  Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0  MB Started . . . . :  12/07/00 12:10:39
  Library . . : PTNOELIB   System name . . :ABSYSTEM
Version/Release  :    5/ 1.0  Stopped . . . . :  12/07/00 23:45:00
Partition ID  : 00         Feature Code  . :22A8-2252-1519
Select Parameters
                          - No Select parameters were chosen.
Omit Parameters
Pools                     - 01 02 03 04
Jobs                      -      /           /Q*
User IDs                  - QSYS
Subsystems                - QINTER     QBATCH
Communications Lines      - ETH1       ETH2       ETH3       ETH4       TRLAN1     TRLAN2
                            TRLAN3     TRLAN4
Control Units             - CTRL1      CTRL2      CTRL3      CTRL4
Sections Printed:
                          - Component Interval Activity
                          - Job Workload Activity
                          - IOP Utilizations
                          - Local Work Stations - Response Time
Buckets
                          - Exception Occurrence Summary and
Interval Counts
                          - Database Journaling Summary
                          - TCP/IP Activity
Sections not printed or partially printed due to Errors:
Sections not printed or partially printed due to Missing data:
```

Example: Omit Parameters

```
                                           Component Report                              2/22/01 10:43:05
                                        Report Selection Criteria                        Page    16
Member  . . . : PT51MBR15  Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0  MB Started . . . . : 12/07/00 12:10:39
  Library . . : PTNOELIB   System name . . :ABSYSTEM
Version/Release :    5/ 1.0 Stopped . . . . : 12/07/00 23:45:00
Partition ID  : 00         Feature Code  . :22A8-2252-1519
Select Parameters
                            - No Select parameters were chosen.
Omit Parameters
Pools                       - 01 02 03 04
Jobs                        -      /            /Q*
User IDs                    - QSYS
Subsystems                  - QINTER      QBATCH
Communications Lines        - ETH1         ETH2         ETH3         ETH4         TRLAN1       TRLAN2
                              TRLAN3       TRLAN4
Control Units               - CTRL1        CTRL2        CTRL3        CTRL4
Sections Printed:
                            - Component Interval Activity
                            - Job Workload Activity
                            - IOP Utilizations
                            - Local Work Stations - Response Time Buckets
                            - Exception Occurrence Summary and Interval Counts
                            - Database Journaling Summary
                            - TCP/IP Activity
Sections not printed or partially printed due to Errors:
Sections not printed or partially printed due to Missing data:
```

Component Report - Domino Server Statistics

The Domino® section of the Component report includes detailed metrics for Domino server statistics for
iSeries™ systems.

Example

```
                                           Component Report
                                        Domino Server Activity

Member  . . . : Q302102959 Model/Serial  . : 820/5H1HM
Main storage . . :  8192.0 MB  Started . . . . :  10/29/02 10:29
  Library . . : ANATESR  System name . . :RCHASSLH
Version/Release :    5/ 3.0 Stopped . . . . : 10/29/02 14:00
Partition ID  : 000        Feature Code  . :23BC-2398-1525
Int Threshold  . :    17.50 %
Virtual Processors:  4   Processor Units :   4.0
Server: 797545/D27DBRAS1/QNOTES
             ----- Peak -----  Mail  ---- ------ Database ---- ------- Name Lookup -------
  Itv   Tns      CPU  Concur  Pending  Waiting  Cache  Cache    Cache  Cache   URLs
  End  /Hour Users Util  Users   Outbound Inbound  Hits   Lookup   Hits   Lookup  Rcv/Sec
 ----- ------ ----- ---- -----  -------- -------  ------  ------   -----  ------ ---------
 00:15 59,920   47 1.17   226         0       0    365     575       0       0         0
 00:30  6,144   45  .85   226         0       0    392     578       0       0         0

   Column               Average
   ------               -------
   Tns/Hour             33,032
   Users                    46
   CPU Util               1.01
   Peak Concurrent Users   226
   Mail Pending Outbound     0
   Mail Waiting Inbound      0
   Database Cache Hits     378
   Database Cache Lookup   576
   Name Lookup Cache Hits    0
   Name Lookup Cache Lookups 0
   URLs Rcv/Sec              0

 Itv End               -- Interval end time (hour and minute)
 Tns/Hour              -- The number of transactions per hour
 Users                 -- The number of users with open sessions on the server
 CPU Util              -- The percentage of CPU used by the job during the interval
 Peak Concur Users     -- The peak number of concurrent users since the server was started
 Mail Pending Outbound -- The number of outbound mail messages waiting to be processed by the Domino router job
 Mail Waiting Inbound  -- The number of inbound mail messages waiting to be processed by the Domino router job
 Database Cache Hits   -- The number of hits to the database cache
 Database Cache Lookups -- The number of lookups to the database cache
 Name Lookup Cache Hits -- The number of cache hits when doing name lookups in the server's name and address book
 Name Lookup Cache Lookup -- The number of lookups in the server's name and address book
 URLs Rcv/Sec          -- The average count of all URLs that have come into the server per second
```

Example: Transaction Reports

There are three different types of transaction reports available.

Transaction Report - Job Summary Report Option

The Job Summary Report Option report provides general job information. Always request this report first.

Job Summary

The Job Summary section of the Job Summary Report shows information for each job in the system.

This information includes:

- The name and type of job (for example, interactive, batch)
- The number of transactions in the job
- The average transaction response time
- The average processing unit time per transaction
- The average number of disk I/O requests per transaction
- The number of lock waits
- The number of seize conflicts
- The key/think time per transaction

If the Job Summary section shows jobs that have high response times, high disk I/O activity, high processing unit utilization, or a number of lock requests, use the Transaction Report to investigate further.

If the number of seizes or number of conflicts (**Number Sze Cft** or **Number Lck Cft** columns on this report) seems "high," look at the Transaction or Transition reports for the job to see how long the conflict lasted, the job that held the object, the name and type of object being held, and what the job was waiting for.

The exact meaning of the term "high" is dependent on the application. One example is the number of **lock-waits**. An application that has many users accessing a database at the same time could, under normal conditions, have numerous lock-waits.

You must evaluate each situation individually. If the values are difficult to explain (an application should have very few locks and yet many are reported), then further analysis will be required. The Transaction and Transition Reports can help in this analysis.

Example

```
                                            Job Summary Report                                    12/13/00 12:16:05
                                                Job Summary                                           Page 0001
                                             Report type *SUMMARY
Member   . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release  :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID : 00       Feature Code  . :22A8-2252-1519
                 *On/Off*    T  P  P  Tot  Response Sec         CPU Sec          ---- Average DIO/Transaction -----   Number  K/T
    Job      User Name/  Job       y  t  r  Nbr  -------------  ------------------  ------ Synchronous ----- --Async--   Cft   /Tns
    Name      Thread   Number  Pl p  y  g  Tns   Avg    Max    Util   Avg    Max  DBR  NDBR  Wrt  Sum  Max  Sum  Max  Lck Sze Sec
---------- ---------- ------ -- -- -- - ----  ------ ------  ---- ------ ------  ---- ---- ---- ---- ---- ---- ----  --- --- -----
SCPF       QSYS       000000 02 X  40
QDBSRV01   QSYS       008309 02 S  09
QDBSRV02   QSYS       008310 02 S  16
QDBSRV03   QSYS       008311 02 S  16
QDBSRV04   QSYS       008312 02 S  52
QDBSRV05   QSYS       008313 02 S  52
QDCPOBJ1   QSYS       008314 02 S  60
QDCPOBJ2   QSYS       008315 02 S  60
QPFRADJ    QSYS       008316 02 S  00                                                                             2
QSPLMAINT  QSYS       008317 02 S  20
QJOBSCD    QSYS       008318 02 S  00
QALERT     QSYS       008319 02 S  20
```

```
QLUR        QSYS      008320  02 S   00
QFILESYS1   QSYS      008321  02 S   00
QDBSRVXR    QSYS      008322  02 S   00
Q400FILSVR  QSYS      008323  02 S   20
QQQTEMP1    QSYS      008324  02 S   20
QQQTEMP2    QSYS      008325  02 S   20
QDBSRVXR2   QSYS      008326  02 S   00
QSYSCOMM1   QSYS      008327  02 S   00
QCMNARB01   QSYS      008328  02 S   00
QCMNARB02   QSYS      008329  02 S   00
QCMNARB03   QSYS      008330  02 S   00
QSYSARB     QSYS      008302  02 S   00
QLUS        QSYS      008307  02 S   00
QSYSARB2    QSYS      008303  02 S   00
QSYSARB3    QSYS      008304  02 S   00
QSYSARB4    QSYS      008305  02 S   00
QSYSARB5    QSYS      008306  02 S   00
QCTL        QSYS      008335  02 M   00
QSYSWRK     QSYS      008336  02 M   00
QIWVPPJT    QUSER     008338  02 BJ  20
QSPL        QSYS      008347  02 M   00
QUSRWRK     QSYS      008348  02 M   00
QSERVER     QSYS      008350  02 M   00
QSNADS      QSYS      008353  02 M   00
QZDAINIT    QUSER     008356  02 BJ  20
QZDSTART    QSNADS    008359  02 A   40
QSYSSCD     QPGMR     008360  02 B   10
QPWFSERVS2  QUSER     008366  02 BJ  20
QINTER      QSYS      008368  02 M   00
QROUTER     QSNADS    008364  02 B   40
QPWFSERVSS  QUSER     008369  02 BJ  20
QBATCH      QSYS      008371  02 M   00
```

System Summary Data

There are three parts to the System Summary Data section of the Job Summary Report.

System Summary Data (First Part):

The first part of the System Summary Data report includes trace periods for trace date and CPI by priority for all jobs for total trace period.

Example

```
                              Job Summary Report                                   12/13/00 12:16:05
                               System Summary Data                                 Page 0006
                               Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
TRACE PERIODS FOR TRACE DATE.
                                  Elapsed
       Started        Stopped     Seconds
       --------       --------    ---------
       11.53.31       11.53.54        22
CPU BY PRIORITY FOR ALL JOBS FOR TOTAL TRACE PERIOD.
                             CPU     Cum CPU    CPU
   Pty        CPU           Util      Util      QM
   ----   --------------   ------    -------   -------
   00            .068        .30       .30      1.003
   01                                  .30      1.003
   09                                  .30      1.003
   10                                  .30      1.003
   11                                  .30      1.003
   13                                  .30      1.003
   15                                  .30      1.003
   16            .001                  .30      1.003
   19                                  .30      1.003
   20            .008        .03       .33      1.003
   25            .049        .22       .55      1.005
   35                                  .55      1.005
   36                                  .55      1.005
   40                                  .55      1.005
   49                                  .55      1.005
   50            .002                  .55      1.005
   52                                  .55      1.005
```

```
60                            .55    1.005
68            .001            .55    1.005
84            .007     .03    .58    1.005
98                            .58    1.005
```

System Summary Data (Second Part):

The second part of the System Summary Data report includes CPU and disk I/O per job type for all jobs for total trace period and interactive transaction averages by job type.

```
Member  . . . : TRACESVT    Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
CPU AND DISK I/O PER JOB TYPE FOR ALL JOBS FOR TOTAL TRACE PERIOD.
     Job         Nbr       CPU       CPU    --Disk I/O Requests--   CPU Sec/    Sync I/O
     Type        Jobs    Seconds     Util    Sync      Async      Sync DIO     /Elp Sec
---------------  -------  ----------  -----  ---------  ---------  --------    -------
INTERACTIVE         10        .0       .0        0          0       .0000         .0
BATCH A,B,C,D,X    328        .1       .5        0          0       .0000         .0
SPOOL WTR/RDR        2        .0       .0        0          0       .0000         .0
SYSTEM JOBS         39        .0       .0        2          0       .0000         .1
SYSTEM TASKS       337        .0       .0       58        102       .0000        2.6
---------------  -------  ----------  -----  ---------  ---------  --------    -------
  ** TOTALS **     716        .1       .5       60        102       .0017        2.7
DATA FOR SELECTED TIME INTERVAL (OR TOTAL TRACE PERIOD IF NO TIME SELECTION).
  INTERACTIVE TRANSACTION AVERAGES BY JOB TYPE.
 T                               Avg    CPU/    ----- Sync Disk I/O Rqs/Tns -----  Async  W-I    Excp    Key/   Active  Est
 y      Nbr    Nbr   Pct    Tns   Rsp    Tns      DB    DB    NDB   NDB         DIO   Wait   Wait   Think    K/T    Of
 p  Prg Jobs   Tns   Tns  /Hour (Sec)  (Sec)   Read  Write Read  Write  Sum    /Tns  /Tns   /Tns    /Tns    /Tns   AWS
 -- --- ----  ------ ----- ----- ----- ------  ----- ----- ----- ----- -----  ----- ------ ------ ------  ------ ---
 I  YES   10     6  100.0   981  .006   .001      0     0     0     0     0      0   .000   .003   5.720   5.720   2
  EXCEPTIONAL WAIT BREAKDOWN BY JOB TYPE.
                       A-I     Short   Short   Seize   Lock    Event   Excs    EM3270  DDM Svr    Other
                       Wait    Wait    WaitX   Wait    Wait    Wait    ACTM     Wait    Wait      Wait
 Type      Purge       /Tns    /Tns    /Tns    /Tns    /Tns    /Tns    /Tns     /Tns    /Tns      /Tns
 ----      -----       ------  ------  ------  ------  ------  ------  ------   ------  -------    ------
 I          YES         .000    .000    .000    .000    .000    .000    .003    .000    .000      .000
```

System Summary Data (Third Part):

The third part of the System Summary Data report includes analysis by interactive transaction categories, response time and key/think time.

```
Member  . . . : TRACESVT    Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
ANALYSIS BY INTERACTIVE TRANSACTION CATEGORIES.
                   Avg            Cum    ----- Sync Disk I/O Rqs/Tns -----  Async          Avg    Excp    Avg    Est
                   CPU    CPU     CPU     DB    DB    NDB   NDB         DIO   Nbr   Pct    Rsp    Wait    K/T    Of
    Category       /Tns   Util    Util   Read  Write Read  Write  Sum    /Tns  Tns   Tns    /Tns   /Tns    /Tns   AWS
---------------   ------- -----  -----  ----- ----- ----- ----- -----  ----- ----- -----  ------- ------- ------- ---
VERY SIMPLE   VS   .001                                                        6  100.0   .006    .003   5.720   2
---------------
 ** SIMPLE    S    .001                                                        6  100.0   .006    .003   5.720   2
    -Boundary-     .071
 ** MEDIUM    M
    -Boundary-     .097
 ** COMPLEX   X
---------------
VERY COMPLEX  VX
---------------   ------- -----  -----  ----- ----- ----- ----- -----  ----- ----- -----  ------- ------- ------- ---
Total/Avg of **    .001                                                        6  100.0   .006    .003   5.720   2
ANALYSIS BY INTERACTIVE RESPONSE TIME.
                   Avg            Cum    Avg            Cum    ----- Sync Disk I/O Rqs/Tns -----  Async  Excp    Avg
                   Rsp    Nbr   Pct    Pct    CPU    CPU   CPU     DB    DB    NDB   NDB         DIO   Wait    K/T
    Category       /Tns   Tns   Tns    Tns    /Tns   Util  Util   Read  Write Read  Write  Sum    /Tns  /Tns    /Tns
---------------   ------- ----- -----  ------- ------- ----- -----  ----- ----- ----- ----- -----  ----- ------- -------
Sub-Second         .006     6  100.0  100.0   .001                                                 .003   5.720
1 - 1.999 Sec                          100.0
2 - 2.999 Sec                          100.0
```

```
3 - 4.999 Sec                          100.0
5 - 9.999 Sec                          100.0
GE 10 Seconds                          100.0
ANALYSIS BY INTERACTIVE KEY/THINK TIME.
                 Avg              Cum   Avg              Cum   ----- Sync Disk I/O Rqs/Tns -----   Async   Avg     Excp
                 K/T   Nbr  Pct   Pct   CPU   CPU   CPU    DB    DB    NDB    NDB          DIO     Rsp     Wait
    Category    /Tns   Tns  Tns   Tns  /Tns   Util  Util  Read  Write  Read  Write   Sum   /Tns    /Tns    /Tns
---------------- ------- ----- ----- ----- ------- ----- ----- ----- ----- ----- ----- ----- ----- ------- -------
LT 2 Seconds     .001     2  33.3  33.3   .002                                                          .004    .002
 2 - 14.999 Sec 11.439    2  33.3  66.6   .002                                                          .004    .001
15 -  29.999 Sec                    66.6
30 -  59.999 Sec                    66.6
60 - 299.999 Sec                    66.6
GE 300 Seconds                      66.6
```
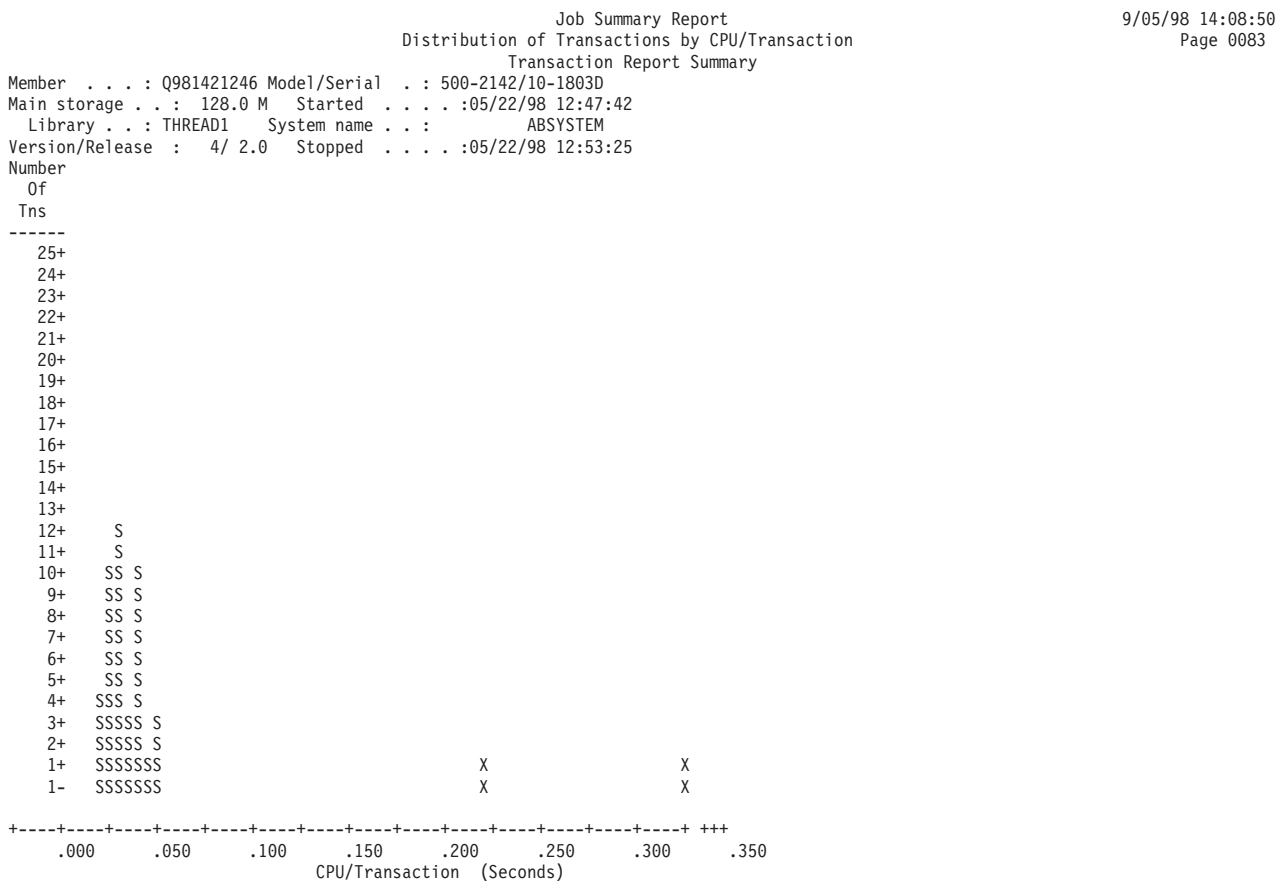
Distribution by CPU/Transaction

The Distribution by CPU/Transaction section of the job summary report provides a graphical view of the distribution of simple, medium, and complex transactions.

Example

This chart shows the number of transactions versus the processing unit time per transaction in seconds.

```
                                Job Summary Report                          9/05/98 14:08:50
                       Distribution of Transactions by CPU/Transaction            Page 0083
                                Transaction Report Summary
Member  . . . : Q981421246 Model/Serial  . : 500-2142/10-1803D
Main storage . . :  128.0 M   Started  . . . . :05/22/98 12:47:42
  Library . . : THREAD1     System name . . :          ABSYSTEM
Version/Release :   4/ 2.0   Stopped  . . . . :05/22/98 12:53:25
Number
  Of
 Tns
------
  25+
  24+
  23+
  22+
  21+
  20+
  19+
  18+
  17+
  16+
  15+
  14+
  13+
  12+      S
  11+      S
  10+     SS S
   9+     SS S
   8+     SS S
   7+     SS S
   6+     SS S
   5+     SS S
   4+     SSS S
   3+     SSSSS S
   2+     SSSSS S
   1+     SSSSSSS          X                 X
   1-     SSSSSSS          X                 X

+----+----+----+----+----+----+----+----+----+----+----+----+----+ +++
   .000     .050     .100     .150     .200     .250     .300     .350
                    CPU/Transaction  (Seconds)
Transaction Categories:
    S = Simple Transactions
    m = Medium Transactions
    X = Complex Transactions
```

Transaction Significance

The Transaction significance section of the job summary report provides a graphical view of the processing unit use, categorized by simple, medium, and complex transactions.

Example

This chart shows the percent of available processing unit time used versus the processing unit time per transaction in seconds.

```
                                    Job Summary Report                                12/13/00 12:16:05
                                  Transaction Significance                                   Page 0010
                                    Report type *SUMMARY
Member  . . . : TRACESVT    Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID : 00       Feature Code  . :22A8-2252-1519
Percent
 CPU
-------
   .1+                                                       X
   .1+                                                       X
   .1+                                                       X
   .1+      S                                                X
   .1+      S                                                X
   .1+      S                                                X
   .1+      S                                                X
   .1+      S                                                X
   .1+    S S                            X                   X
   .1+    S S                            X                   X
   .1+    S S                            X                   X
   .0+    S S                            X                   X
   .0+    S S                            X                   X
   .0+    S S                            X                   X
   .0+    S S                            X                   X
   .0+    S S                            X                   X
   .0+   SS S S                          X                   X
   .0+   SS S S                          X                   X
   .0+   SS S S                          X                   X
   .0+   SS S S                          X                   X
   .0+   SSSS S                          X                   X
   .0+   SSSS S                          X                   X
   .0+   SSSS S                          X                   X
   .0+   SSSSSS                          X                   X
   .0+  SSSSSSS                          X                   X
   .0-  SSSSSSS                          X                   X

+----+----+----+----+----+----+----+----+----+----+----+----+----+ +++
   .000     .050     .100     .150     .200     .250     .300     .350
                    CPU/Transaction  (Seconds)
Transaction Categories:
    S = Simple Transactions
    m = Medium Transactions
    X = Complex Transactions
```

Interactive Transactions by 5-Minute Intervals

The Interactive Transactions by 5-minute intervals section of the job summary report provides a count of the number of active jobs during a 5-minute interval that performed at least one transaction. It also shows the number of jobs that were signed on and off during the 5-minute intervals. Transaction rates per 5-minute intervals are shown in several different formats.

Example

```
                                    Job Summary Report                                12/13/00 12:16:05
                          Interactive Transactions by 5 Minute Intervals                     Page 0011
                                    Report type *SUMMARY
Member  . . . : TRACESVT    Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID : 00       Feature Code  . :22A8-2252-1519
                       --- Pct Of Tns --- Pct CPU By  Nbr
Nbr  Sync  Async   Avg   Excp    Pct   Seize Active Est Itv  Active  Nbr  Tns   --- Categories --- Categories Sign
Sign DIO   DIO     Rsp   Wait   Ex-Wt  Wait  K/T   Of End   Jobs    Tns  /Hour %VS* %S %M %X *%VX  %S %M %X   offs
ons  /Tns  /Tns   /Tns   /Tns   /Rsp   /Tns  /Tns  AWS
----- ------ ----- ----- ---- --+--+-- ---- ---+--+--- ---- ---- ----- ----- ------- ------- ----- ------ ------ ---
 ***
11.55*   1     6    72  100*100  0  0 *  0   0 0   0                         .005   .003   60              5.500
       * Denotes Partial Interval Data
```

Interactive Throughput by 5-Minute Intervals

The Interactive Throughput by 5-minute intervals section of the job summary report provides simple, medium, and complex transactions relative to the number of transactions according to an interval end time.

Example

```
                                     Job Summary Report                           12/13/00 12:16:05
                             Interactive Throughput by 5 Minute Intervals                Page 0012
                                       Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped . . . . :12/13/00 11:53:54
Partition ID  : 00          Feature Code  . :22A8-2252-1519
                            Number Of Transactions Per Hour
 Itv
 End
       0       400      800     1200     1600     2000     2400     2800
-----
+----+----+----+----+----+----+----+----+----+----+----+----+----+  ***
15/05
XXXXXXXXXXXXXXXXXXSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
Throughput Components:
     S = Simple Transactions
     m = Medium Transactions
     X = Complex Transactions
```

Interactive CPU Utilization by 5-Minute Intervals

The Interactive CPU Utilization by 5-minute intervals section of the job summary report provides simple, medium, and complex transactions relative to their processing unit utilization.

Example

```
                                     Job Summary Report                           12/13/00 12:16:05
                           Interactive CPU Utilization by 5 Minute Intervals            Page 0013
                                       Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped . . . . :12/13/00 11:53:54
Partition ID  : 00          Feature Code  . :22A8-2252-1519
                            Percent CPU Utilization
 Itv
 End   0  10  20  30  40  50  60  70  80  90  100
-----     +----+----+----+----+----+----+----+----+----+
 ***
15/05   XXXX
CPU Components:
     S = Simple Transactions
     m = Medium Transactions
     X = Complex Transactions
```

Interactive Response Time by 5-Minute Intervals

The Interactive Response Time by 5-minute intervals section of the job summary report provides the response components relative to the resulting response time.

Example

```
                                     Job Summary Report                           12/13/00 12:16:05
                          Interactive Response Time by 5 Minute Intervals               Page 0014
                                       Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped . . . . :12/13/00 11:53:54
Partition ID  : 00          Feature Code  . :22A8-2252-1519
                            Average Response Time (Seconds)
 Itv
 End
       0      1.00     2.00     3.00     4.00     5.00     6.00     7.00
-----
+----+----+----+----+----+----+----+----+----+----+----+----+----+  ***
```

```
15/05    RRRRRRRRRRRR
Response Components:
     R = CPU + Disk + Wait-to-Ineligible
     w = Exceptional Wait
```

Scatter Diagram

The Scatter diagram section of the job summary report shows the average of measured response times for
5-minute intervals compared to transaction rates.

```
                    Job Summary Report                              12/13/00 12:16:05
                              Interactive Response Time by 5 Minute Intervals              Page 0014
                                             Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release  :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
                          Average Response Time (Seconds)
 Itv
 End    0    1.00    2.00    3.00    4.00    5.00    6.00    7.00
-----
     +----+----+----+----+----+----+----+----+----+----+----+----+----+
Response Components:
     R = CPU + Disk + Wait-to-Ineligible
     w = Exceptional Wait
                                          Job Summary
Report                                  12/13/00 12:16:05
                            Scatter Diagram of Interactive
Transactions by 5 Minute Intervals                    Page 0015
                                        Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release  :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
                      Response Time vs Number of Transactions per Hour


   ------------------------------------------------
    OVFLW
    -----
    7.00+
       -
 R     -
 E     -
 S  6.00+
 P     -
 O     -
 N     -
 S  5.00+
 E     -
       -
 T     -
 I  4.00+
 M     -
 E     -
       -
 I  3.00+
 N     -
       -
 S     -
 E  2.00+
 C     -
 O     -
 N     -
 D  1.00+
 S     -
       -
       -                                   0
       -
0.00+----+----+----+----+----+----+----+----+----+----+----+----+----+:0
     0    100    200    300    400    500
600     700:F
                    Number of Transactions per Hour
 Legend:    1-9 Indicates the Number of Occurrences.
            *  Indicates more than 9 Occurrences.
            0  Identifies Average of All Occurrences.
```

Interactive Program Statistics

The Interactive Program Statistics section of the Job Summary Report gives additional program information.

This information includes showing the top 10 programs with the largest average:

- Processing unit time per transaction
- Synchronous disk I/O per transaction
- Asynchronous disk I/O per transaction
- Response time per transaction
- Synchronous database reads per transaction
- Synchronous database writes per transaction
- Synchronous nondatabase reads per transaction
- Synchronous nondatabase writes per transaction

Example

```
                                          Job Summary Report                                5/07/98 13:52:10
                                    Interactive Program Statistics                           Page 0019
Member  . . . : CAJ0503    Model/Serial  . : 510-2144/10-08BCD
Main storage . . : 384.0 M   Started  . . . . : 05 03 98 14:59:44
  Library . . : QPFRDATA   System name . . :        ABSYSTEM
Version/Release :   4/ 2.0   Stopped  . . . . : 05 03 98 15:04:36
```

Rank	Number Tns	Program Name	CPU /Tns	CPU Util	Cum CPU Util	DB Read	DB Write	NDB Read	NDB Write	Sum	Async DIO /Tns	Rsp /Tns	Short Wait /Tns	Seize Wait /Tns	Pct Tns	Cum Pct Tns
1	147	QUIINMGR	.085	4.3	4.3		1	4	11	15	10	.792		.031	65.3	65.3
2	32	QSPDSPF	.007	.1	4.3		1			1	1	.047			14.2	79.6
3	19	QPTPRCSS	.023	.2	4.5			1		1		.051			8.4	88.0
4	17	QUYLIST	.063	.4	4.9			11	2	13	2	.411			7.6	95.6
5	3	QSUBLDS	.101	.1	5.0			32		32		1.021			1.3	96.9
6	2	QUOCPP	.034		5.0			6	5	11	2	.433		.035	.9	97.8
7	2	QUIALIST	.013		5.0				1	1		.034			.9	98.7
8	1	*TRACEOFF*	9.508	3.3	8.2	27	209	1852	2570	4658	2118	157.268		.039	.4	99.1
9	1	QMHDSMSS	.062		8.3			3		3		.135			.4	99.6
10	1	QUOCMD	.044		8.3			1		1		.068			.4	100.0

Summary of Seize/Lock Conflicts by Object

The Summary of Seize/Lock Conflicts by Object section of the Job Summary Report displays information about the locks and seizes associated with objects.

The unnamed object, shown as ADDR 00000E00, is the Licensed Internal Code database in-use table. It often appears in this report when there are a high number of database file opens and closes.

Example

```
                                          Job Summary Report                                5/07/98 13:52:10
                                         Summary of Seize/Lock
Conflicts by Object                          Page 0032
Member  . . . : MON3D7CRT  Model/Serial  . : 510-2144/10-08BCD
Main storage . . : 384.0 M   Started  . . . . :05 13 98 11:14:15
  Library . . : QPFRDATA   System name . . :        ABSYSTEM
Version/Release :   4/ 2.0   Stopped  . . . . :05 13 98 12:14:01
```

Type	Library	File	Member	Interactive Waiters Seizes		Interactive Waiters Locks		Non-Interactive Waiters Seizes		Locks	
				Number	Avg Sec	Number	Avg Sec	Number	Avg Sec	Number	Avg Sec
DS	CVTV3R2CAJ	QAPMJOBS								3	.080
DS	CVTV3R2CAJ	QAPMLIOP								2	.001
DS	CVTV3R2CAJ	QAPMPOOL								2	.106
DS	CVTV3R2CAJ	QAPMRESP								2	.087
DS	QUSRSYS	QASNADSQ						1	.406		
DSI	CVTV3R2CAJ	QAPMCONF								2	.006
DSI	CVTV3R2CAJ	QAPMLIOP								2	.013
DSI	CVTV3R2CAJ	QAPMPOOL								1	.015
FILE	QSPL	Q04079N003						14	.428		
JOBQ	QSYS	QNMSVQ						3	.017	1	.062
JOBQ	QSYS	QSYSNOMAX								8	.020
LIB		QRECOVERY								2	.092

```
LIB                    QSPL                                                                                              8      .046
LIB                    QSVMSS                                                                                           14      .038
LIB                    QUSRSYS                                                                                           8      .197
LIB                    SOFIACN                                                                                           1
MI Q      QUSRSYS      QS2RRAPPN                                                      2       1.263
MSGQ      QSYS         QHST                                                           7        .038                      8      .343
OUTQ      QUSRSYS      QEZJOBLOG                                                                                         6      .021
SMIDX     QSVMSS       QCQJMSMI                                                                                         2
SPLCB                  QSPSCB                                                         6       2.556
USRPRF                 MORIHE                                                                                           4      .071
USRPRF                 QDBSHR                                                                                          22      .039
USRPRF                 QSVCCS                                                                                          21      .043
USRPRF                 QSYS                                                                                             1      .038
1E0101                                                                                                                 1      .029
----------------------------------------------  ------  --------  ------  --------    ------  --------  ------  --------
* Total Conflicts and Avg Sec/Conflict                                              36        .847    191      .065
                                                ------            ------
* Total Transactions With Conflicts
                                                ------            ------
* Averages Per Conflict Transaction
```

Special System Information

In general, this information identifies exceptional conditions and events that occur over the measurement period. If you analyze these exceptions, you might find jobs and programs you need to examine.

Priority-Jobtype-Pool Statistics:

The Priority-Jobtype-Pool Statistics section of the Job summary report displays the total processing unit seconds and physical I/O requests for each category of priority-jobtype and pool combination recorded during the overall test period.

Example

The number of total transactions is shown for job type I only.

```
                                         Job Summary Report                                     12/13/00 12:16:05

Priority-Jobtype-Pool Statistics                                    Page 0016
                                                          Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release  :  5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00          Feature Code  . :22A8-2252-1519
         Job                   CPU          --- Disk I/O Requests ----     Number
Pty     Type      Pool       Seconds         Sync          Async            Tns
---     ----      ----     -----------     -----------    -----------     ----------
00       L        01           .056             58            102
00       L        02           .004
00       L        04           .007
00       M        02
00       S        02           .001              2
01       B        02
09       S        02
10       B        02
10       BJ       02
11       B        02
13       B        02
15       A        02
16       B        02           .001
16       S        02
19       B        02
20       A        02
20       B        02
20       BD       02
20       BJ       02
20       I        04           .008                                            5
20       L        01
20       S        02
25       B        02           .049
25       BD       02
25       BJ       02
35       B        02
36       L        01
36       L        04
40       A        02
40       B        02
```

```
40         X         02
49         L         01
50         A         02
50         B         02              .002
50         W         03
52         L         01
52         S         02
60         S         02
68         L         01              .001
84         L         01              .007
98         L         01
```

Job Statistics:

The Job Statistics section of the Job summary report displays the top 10 jobs with certain statistics.

The statistics displayed include
- Most transactions (shown in sample report below)
- Largest average response time
- Largest average processing unit time per transaction
- Largest synchronous disk I/O per transaction A synchronous disk I/O is a disk access operation that must complete before program operation can continue.
- Largest asynchronous disk I/O per transaction. An asynchronous disk I/O is a disk access operation that is not expected to complete before program operation can continue.
- Most seize conflicts
- Most record lock conflicts
- Most active-to-ineligible occurrences
- Most wait-to-ineligible occurrences
- Most event wait occurrences

Example

```
                              Job Summary Report                          12/13/00 12:16:05
                                 Job Statistics                                        Page 0017
                                Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID : 00       Feature Code  . :22A8-2252-1519
JOBS WITH MOST TRANSACTIONS
                                      T  P                        Cum  Sync Async                  Number      Cum
         Job      User Name/  Job        y  t  Nbr   Rsp    CPU   CPU  CPU  DIO  DIO  Nbr Nbr Nbr Conflict Pct  Pct
Rank     Name     Thread      Number  Pl p  y  Tns   /Tns   /Tns  Util Util /Tns /Tns W-I A-I Evt Lck Sze Tns  Tns
----    ---------- ---------- ------  -- -- -- ----- ------ ------ ---- ---- ----- ----- --- --- --- --- --- ---- ----
  1     QPADEV0009 SUSTAITA   013832  04  I  20   43   .035   .018   .2   .2                                  93.5  93.5
  2     QPADEV0026 SOLBERG    013841  04  I  20    3  4.918   .179   .2   .4   154                            6.5 100.0
  3
  4
  5
  6
  7
  8
  9
 10
JOBS WITH LARGEST AVERAGE RESPONSE TIME
```

Interactive Program Statistics:

The Interactive Program Statistics section of the Job summary report gives additional information showing the top 10 programs with the largest averages.

These averages include:
- Processing unit time per transaction
- Synchronous disk I/O per transaction

- Asynchronous disk I/O per transaction
- Response time per transaction
- Synchronous database reads per transaction
- Synchronous database writes per transaction
- Synchronous nondatabase reads per transaction
- Synchronous nondatabase writes per transaction

Example

```
                                    Job Summary Report                              12/13/00 12:16:05
                                Interactive Program Statistics                              Page 0022
                                    Report type *SUMMARY
Member  . . . : TRACESVT    Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
PROGRAMS WITH HIGHEST CPU/TNS
                                        Cum   ----- Sync Disk I/O Rqs/Tns -----   Async              Short   Seize           Cum
        Number  Program        CPU   CPU  CPU    DB    DB   NDB   NDB             DIO     Rsp    Wait    Wait    Pct   Pct
Rank    Tns     Name          /Tns   Util Util  Read  Write Read  Write  Sum     /Tns    /Tns   /Tns    /Tns    Tns   Tns
----    ------  ----------    ------ ---- ----  ----- ----- ----- ----- -----   -----   ------  ------  ------  ----  ----
1         2     QUIINMGR       .002                                                      .005                    33.3  33.3
2         1     *TRACEOFF*     .002                                                      .003                    16.7  50.0
3         3     QSCTI1         .001                                                      .007                    50.0 100.0
4
5
6
7
8
9
10
```

Individual Transaction Statistics:

The Individual Transaction Statistics section of the Job Summary Report lists transaction statistics.

These statistics are the 10 transactions with the least or most:
- Response time (shown in sample report)
- Processing unit service time
- Total synchronous disk I/O
- Total asynchronous disk I/O
- Synchronous database reads
- Synchronous database writes
- Synchronous nondatabase reads
- Synchronous nondatabase writes
- Asynchronous database reads
- Asynchronous database writes
- Asynchronous nondatabase reads
- Asynchronous nondatabase writes
- Short-wait-extended time
- Short-wait time
- Lock-wait time
- Excessive activity-level wait time
- Active time
- Binary overflow exceptions
- Decimal overflow exceptions
- Floating point overflow exceptions

- Process access group fault exceptions
- Permanent writes

Example

```
                                          Job Summary Report                            12/13/00 12:16:05
                                    Individual Transaction Statistics                    Page 0025
                                          Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00         Feature Code  . :22A8-2252-1519
TRANSACTIONS WITH LONGEST RESPONSE TIMES
Rank       Value         Time        Program      Job Name     User Name    Number   Thread     Pool   Type   Priority
----    ------------  ------------  ----------   ----------   ----------   ------   --------   ----   ----   --------
  1           .015    11.53.31.746   QSCTI1       QPADEV000P   SUSTAITA     011615             04     ID      20
  2           .005    11.53.31.753   QUIINMGR     QPADEV000P   SUSTAITA     011615             04     ID      20
  3           .004    11.53.54.633   QSCTI1       QPADEV000P   SUSTAITA     011615             04     ID      20
  4           .004    11.53.45.609   QUIINMGR     QPADEV000P   SUSTAITA     011615             04     ID      20
  5           .003    11.53.54.636   *TRACEOFF*   QPADEV000P   SUSTAITA     011615             04     ID      20
  6           .003    11.53.31.746   QSCTI1       QPADEV000P   SUSTAITA     011615             04     ID      20
  7                                                                                                   D
  8                                                                                                   D
  9                                                                                                   D
 10                                                                                                   D
TRANSACTIONS WITH LONGEST CPU SERVICE TIME
Rank       Value         Time        Program      Job Name     User Name    Number   Thread     Pool   Type   Priority
----    ------------  ------------  ----------   ----------   ----------   ------   --------   ----   ----   --------
  1           .002    11.53.54.636   *TRACEOFF*   QPADEV000P   SUSTAITA     011615             04     ID      20
  2           .002    11.53.45.609   QUIINMGR     QPADEV000P   SUSTAITA     011615             04     ID      20
  3           .001    11.53.54.633   QSCTI1       QPADEV000P   SUSTAITA     011615             04     ID      20
  4           .001    11.53.31.753   QUIINMGR     QPADEV000P   SUSTAITA     011615             04     ID      20
  5           .001    11.53.31.746   QSCTI1       QPADEV000P   SUSTAITA     011615             04     ID      20
  6           .001    11.53.31.746   QSCTI1       QPADEV000P   SUSTAITA     011615             04     ID      20
  7                                                                                                   D
  8                                                                                                   D
  9                                                                                                   D
 10                                                                                                   D
```

Longest Seize/Lock Conflicts:

The Longest Seize/Lock Conflicts section of the Job summary report shows the 30 longest lock or seize conflicts during the trace period.

Example

```
                                          Job Summary Report                            12/13/00 12:16:05
                                       Longest Seize/Lock Conflicts                      Page 0027
                                          Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00         Feature Code  . :22A8-2252-1519
                                    Job      User Name/  Job              Holder- Job Name.. User Name. Number   Pool  Type  Pty
Rank     Value         Time       Name     Thread      Number Pl Typ Pty S/L Object- Type.. Library... File...... Member.... RRN......
----  ------------  ------------  ---------- ----------  ------ -- --- --- --- ----------------------------------------------------
  1       20.679   08.00.43.582  QPADEV0017  0000000D    023398 04  I   01  L   HOLDER- QPADEV0016 COOK          023399   04    I    20
                                                                            OBJECT- DS       PFREXP     CSTFIL                000002000
  2       15.999   08.00.09.324  QPADEV0017  0000000D    023398 04  I   01  L   HOLDER- QPADEV0016 COOK          023399   04    I    20
                                                                            OBJECT- DS       PFREXP     CSTFIL                000001000
  3       14.183   08.01.16.807  QPADEV0017  0000000D    023398 04  I   01  L   HOLDER- QPADEV0016 COOK          023399   04    I    20
                                                                            OBJECT- DS       PFREXP     CSTFIL                000003000
  4         .034   08.00.25.331  QPADEV0017  0000000D    023398 04  I   01  L   HOLDER- QPADEV0016 COOK          023399   04    I    20
                                                                            OBJECT- DS       PFREXP     ITMFIL                000001000
  5         .023   08.01.04.268  QPADEV0017  0000000D    023398 04  I   01  L   HOLDER- QPADEV0016 COOK          023399   04    I    20
                                                                            OBJECT- DS       PFREXP     ITMFIL                000002000
  6         .022   08.01.30.999  QPADEV0017  0000000D    023398 04  I   01  L   HOLDER- QPADEV0016 COOK          023399   04    I    20
                                                                            OBJECT- DS       PFREXP     ITMFIL                000003000
```

Longest Holders of Seize/Lock Conflicts:

The Longest Holders of Seize/Lock Conflicts shows the holders of the longest lock or seize conflicts for all job types during the trace period.

Example

```
                                      Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID : 00         Feature Code  . :22A8-2252-1519
                             Job     User Name/  Job                    -------------------- Object ----------------------
Rank   Value      Time       Name    Thread      Number  Pl  Typ Pty  S/L  Type    Library    File       Member     RRN
----  --------  ------------  ----------  ----------  ------  --  --- ---  ---  ------  ----------  ----------  ----------  ---------
 1    20.679   08.00.43.581  QPADEV0016  0000000D  023399  04   I   20   L   DS     PFREXP     CSTFIL                 000002000
 2    15.999   08.00.09.324  QPADEV0016  0000000D  023399  04   I   20   L   DS     PFREXP     CSTFIL                 000001000
 3    14.183   08.01.16.808  QPADEV0016  0000000D  023399  04   I   20   L   DS     PFREXP     CSTFIL                 000003000
 4     .034    08.00.25.332  QPADEV0016  0000000D  023399  04   I   20   L   DS     PFREXP     ITMFIL                 000001000
 5     .023    08.01.04.269  QPADEV0016  0000000D  023399  04   I   20   L   DS     PFREXP     ITMFIL                 000002000
 6     .022    08.01.30.999  QPADEV0016  0000000D  023399  04   I   20   L   DS     PFREXP     ITMFIL                 000003000
```

Batch Job Analysis:

The Batch Job Analysis section of the Job Summary Report shows information on the batch job workload during the trace period.

Note: The Batch Job Analysis section does not print if you also specify a value on the select job (SLTJOB) parameter or the omit job (OMTJOB) parameter.

Example

```
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID : 00         Feature Code  . :22A8-2252-1519
                         T  P                                                       Sync    Async    --- Synchronous ---    Excp
  Job      User Name/  Job    y  t                       Elapsed    CPU    CPU    Disk    Disk    BCPU   --DIO/Sec--    Wait
  Name     Thread      Number Pl p  y  Start    Stop    Seconds  Seconds  Util   I/O     I/O     /DIO  Elp Act Ded    Sec
---------- ---------- ------ -- -- -- -------- -------- ---------- --------- ----- -------- -------- -------- --- --- --- ---------
QIWVPPJT   QUSER      008338 02 BJ 20 11.53.31 11.53.54   22.907                                                          22.90
QZDAINIT   QUSER      008356 02 BJ 20 11.53.31 11.53.54   22.907                                                          22.90
QSYSSCD    QPGMR      008360 02 B  10 11.53.31 11.53.54   22.906                                                          22.90
QPWFSERVS2 QUSER      008366 02 BJ 20 11.53.31 11.53.54   22.906                                                          22.90
QROUTER    QSNADS     008364 02 B  40 11.53.31 11.53.54   22.906                                                          22.90
QPWFSERVSS QUSER      008369 02 BJ 20 11.53.31 11.53.54   22.906                                                          22.90
QPWFSERV   QUSER      008375 02 BJ 20 11.53.31 11.53.54   22.906                                                          22.90
QZDASSINIT QUSER      008378 02 BJ 20 11.53.31 11.53.54   22.906                                                          22.90
QNMAPINGD  QUSER      008379 02 BJ 25 11.53.31 11.53.54   22.906                                                          22.90
   .
   .
   .
```

Concurrent Batch Job Statistics:

The Concurrent Batch Job Statistics section of the Job summary report shows information on the batch job workload during the trace period according to job sets.

By looking at the first lines for a particular priority, you can quickly determine if the system was fully utilizing all available batch activity levels during the trace period.

Collection Services begins identifying concurrent jobs when it starts collecting data. All jobs that are currently active are assigned to a job set. There will often be several jobs that are continuously active during the trace period, such as an autostart job for SNADS.

If another job starts during the trace period and none of the original jobs have ended, it is assigned to a new job set. If a job ends and another job of the same priority starts, the new job is considered to be a second job in the same job set. For example, if the job queue entry for QBATCH has a MAXACT parameter of 3 and you submit 8 jobs to QBATCH during the trace period, there will probably be 3 job sets on the report with a total of 8 jobs shared between them.

The job sets are sorted by job priority. Thus, for the above example where the first job set was running for a total of 8 minutes and 50 seconds and the second job set was running for a total of 6 minutes and 55 seconds, the order of reporting shows the statistics for the second job set, then the third, and then the first and assigns them sequential numbers.

Example

```
                              Job Summary Report                        12/13/00 12:16:05
                         Concurrent Batch Job Statistics                       Page 0037
                              Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Partition ID  : 00        Feature Code  . :22A8-2252-1519
 Job                 Number    Elapsed       CPU        Excp        Sync        Async
 Set       Pty       Jobs      Seconds      Seconds      Wait      Disk I/O    Disk I/O
------     ---      ------    --------     --------    --------    --------    --------
    1       10         1       22.906                   22.900
    2       10         1       22.906                   22.900
    3       10         1       22.907                   22.900
    4       10         1       22.907                   22.900
    5       10         1       22.907                   22.900
    6       10         1       22.907                   22.900
    7       20         1       22.906                   22.900
    8       20         1       22.906                   22.900
    9       20         1       22.906                   22.900
   10       20         1       22.906                   22.900
   11       20         1       22.906                   22.900
   12       20         1       22.906                   22.900
   13       20         1       22.906                   22.900
   14       20         1       22.906                   22.900
   15       20         1       22.906                   22.900
   16       20         1       22.906                   22.900
   17       20         1       22.906                   22.900
   18       20         1       22.906                   22.900
   19       20         1       22.907                   22.900
   20       20         1       22.907                   22.900
    .
    .
    .
```

Selection Criteria:

The Selection Criteria section of the Job summary report shows the selection values you chose to produce the report.

Use the SELECT parameters on the Report Selection Criteria Report to select pools, jobs, user IDs or functional areas. Or use the OMIT parameters to omit them.

If you did not use SELECT parameters, the `No Select parameters were chosen` message appears.

If you did not use OMIT parameters, the `No Omit parameters were chosen` message appears.

The options that were selected are also given.

Example

```
                              Job Summary Report                        12/13/00 12:16:05
                          Report Selection Criteria                            Page 0040
                              Report type *SUMMARY
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT    System name . . :ABSYSTEM
Version/Release :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
```

```
Partition ID  : 00          Feature Code  . :22A8-2252-1519
Select Parameters
                            - No Select parameters were chosen.
Omit Parameters
                            - No Omit parameters were chosen.
Options Selected            - SS  INCLUDE SPECIAL SUMMARY REPORTS
```

Transaction Report - Transaction Report Option

The Transaction Report (RPTTYPE(*TNSACT)) option provides detailed information about each transaction that occurred in the job.

This information includes:

- Transaction response time
- Name of the program that is active at the time the transaction starts
- Processing unit time use
- Number of I/O requests

The Transaction Report output has two parts:

- The details, which show data about each transaction in the job
- The summary, which shows data about overall job operation

Example

Note: This Transaction Report ran a collection with thread activity. The report header shows the thread identifier because the job is a secondary thread.

```
                                          Transaction Report                          12/13/00 12:03:40
                                          Report type
*TNSACT                                   Page 0001
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release :  5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Job name  . . : QPFRADJ    User name . . . :        QSYS
Job number . . . :  008316  TDE/Pl/Pty/Prg . :   01EC/02/00/
Partition ID  : 00          Feature Code  . :22A8-2252-1519
        E          T   CPU   ---- Physical I/O Counts -----
***** Transaction Response Time (Sec/Tns) ****** -BMPL-
        x          y   Sec  ----- Synchronous ------ Async
******  - Activity Level Time -  Inel  Long  C   I Seize       c  Program p  Per   DB  DB NDB   NDB      Disk
****          Short  Seize  Time   Wait  u   n Hold Key/
  Time   p   Name  e  Tns  Read Wrt Read Wrt Sum I/O   **    Active  Wait    Cft  A-I/W-I Lck/Oth r  l  Time  Think
-------- - ---------- - ------- ---- ---- --- ---- ---- ---- -------- ------- ------- ------- ------- -- -- ----- ------
11.53.31  QWCPMNRR       .001          1   1   2   0    .038    .038                                  1              .0
---------------------------------------------
J O B  S U M M A R Y  D A T A  (T O T A L S)
---------------------------------------------
      Average       .001  0   0   1   1   2   0    .038    .038   .000   .000   .000   .000         .0    .0
      Count                                1   1
      Minimum       .001                       2        .038    .038                                       .0
      Maximum       .001                       2        .038    .038                                       .0
      Total/Job     .001                       2   0  22.907 Elapsed     .0 Percent CPU Utilization
```

Related reference

Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

Each report includes columns of information. Look here for descriptions of that information.

Transaction Report - Transition Report Option

The Transition Report (RPTTYPE(*TRSIT)) option provides information similar to that of the Transaction Report, but the data (for example, processing unit time, I/O requests) is shown for each job state transition, rather than just the transitions shown when the job is waiting for work station input.

The detail shown in this report helps you to determine the program that ran during a transition, or to determine when an unsatisfied lock request occurred.

The Transition Report is composed of two sections:
- Transition Detail, which shows each state transition made by the job (going from one state to another, such as active-to-ineligible)
- Summary, which shows the same data as the summary output from the Transaction Report

Example

Note: This Transition Report ran a collection with thread activity. The report header shows the thread identifier because the job is a secondary thread.

```
                                           Transition Report                                  12/13/00 12:09:58
                                           Report type *TRSIT                                  Page 0001
Member  . . . : TRACESVT   Model/Serial  . : 270/10-45WFM
Main storage . . : 2048.0 MB  Started  . . . . :12/13/00 11:53:31
  Library . . : TRACESVT   System name . . :ABSYSTEM
Version/Release  :   5/ 1.0   Stopped  . . . . :12/13/00 11:53:54
Job name  . . : SCPF        User name . . . :      QSYS
Job number . . . :   000000   TDE/Pl/Pty/Prg . :   0188/02/40/
Partition ID  : 00          Feature Code . :22A8-2252-1519
Job type  . . : X        Elapsed Time -- Seconds              Sync/Async Phy I/O    -MPL-
                         ----------------------        ----------------------- C   I      Last 4 Programs in Invocation Stack
            State Wait  Long   Active  Inel   CPU   DB   DB NDB  NDB       u   n -------------------------------------------
    Time    W A I Code  Wait   /Rsp*   Wait   Sec  Read Wrt Read Wrt Tot  r   l   Last     Second     Third     Fourth
----------- ----- ----- ------ ------- ------ -------- ---- ---- ---- ---- ---- -- -- ---------- ---------- ---------- ----------
11.53.31.739 *TRACE ON
11.53.54.645     /OFF
11.53.54.645 *TRACE OFF
 ---------- *TRACEOFF*         .000*              0    0    0    0    0*
---------------------------------------------
J O B   S U M M A R Y   D A T A   (T O T A L S)
---------------------------------------------
                      CPU   ---- Physical I/O Counts ----- *****
Transaction Response Time (Sec/Tns) ****** -BMPL-
                      Sec   ----- Synchronous ------ Async   ****** - Activity Level Time -  Inel    Long    C   I Seize
                      Per    DB   DB NDB   NDB    Disk    ****        Short   Seize  Time   Wait   u   n Hold   Key/
                      Tns   Read Wrt Read  Wrt  Sum  I/O     **
   Active   Wait    Cft  A-I/W-I Lck/Oth  r   l  Time  Think
                      ------- ---- ---- ---- ---- ---- ----- -------- ------- ------- ------- ------- ------- -- -- ----- ------
     Average       .000   0    0    0    0    0    0    .000    .000    .000    .000    .000    .000           .0     .0
     Count
     Minimum                                                                                                          .0
     Maximum                                                                                                          .0
     Total/Job     .000                  0    0   22.907 Elapsed     .0 Percent CPU Utilization
```

Related reference

"Performance Report header" on page 10
Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

"Performance Report columns" on page 59
Each report includes columns of information. Look here for descriptions of that information.

Example: Lock Report

There are two sections to a lock report.

Related reference

"Performance Report header" on page 10
Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

"Performance Report columns" on page 59
Each report includes columns of information. Look here for descriptions of that information.

Lock Report - Detail

The Detail section of the Lock report shows a sample of the detail listing, sorted by time of day. The report options were selected to include only locks lasting at least two seconds that occurred between 13:33:00 and 13:34:00.

Example

```
12/14/00 12:46:01                          Seize/Lock Wait
Statistics by Time of Day                                    Page    1
                                            Report type
*ALL
 TOD of  Length                                              Object                          Record
  Wait   of Wait L Requestor's Job Name      Holder's Job Name           Type    Object Name               Number
-------- ------- - ------------------------- ------------------------- ------ -------------------------------- ----------
12.05.39    4264 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.41    6866 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
12.05.55    7858 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.57    8988 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
Member LCKTRC1       Library TRACESVT      Period from 00.00.00
through 23.59.59      500 ms minimum wait12/14/00 12:46:01

                                           Seize/Lock Wait
Statistics by Requesting Job                                 Page    2
                                            Report type
*ALL
 TOD of  Length                                              Object                          Record
  Wait   of Wait L Requestor's Job Name      Holder's Job Name           Type    Object Name               Number
-------- ------- - ------------------------- ------------------------- ------ -------------------------------- ----------
12.05.41    6866 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
12.05.57    8988 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
12.05.39    4264 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.55    7858 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
Member LCKTRC1       Library TRACESVT      Period from 00.00.00
through 23.59.59      500 ms minimum wait
12/14/00 12:46:01                          Seize/Lock Wait
Statistics by Holding Job                                    Page    3
                                            Report type
*ALL
 TOD of  Length                                              Object                          Record
  Wait   of Wait L Requestor's Job Name      Holder's Job Name           Type    Object Name               Number
-------- ------- - ------------------------- ------------------------- ------ -------------------------------- ----------
12.05.39    4264 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.55    7858 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.41    6866 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
12.05.57    8988 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
Member LCKTRC1       Library TRACESVT      Period from 00.00.00
through 23.59.59      500 ms minimum wait
12/14/00 12:46:01                          Seize/Lock Wait
Statistics by Object                                         Page    4
                                            Report type
*ALL
 TOD of  Length                                              Object                          Record
  Wait   of Wait L Requestor's Job Name      Holder's Job Name           Type    Object Name               Number
-------- ------- - ------------------------- ------------------------- ------ -------------------------------- ----------
12.05.39    4264 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.41    6866 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
12.05.55    7858 L QPADEV0006 SUSTAITA   012538 QPADEV000R SUSTAITA   012535 PGM    QAVCPP      QPFR
12.05.57    8988 L QPADEV000S SUSTAITA   012537 QPADEV0006 SUSTAITA   012538 PGM    QAVCPP      QPFR
Member LCKTRC1       Library TRACESVT      Period from 00.00.00
through 23.59.59      500 ms minimum wait
```

Lock Report-Summary

The Summary section of the Lock report shows a sample of the Requesting Job Summary section of the same report. The other summary sections have a similar format.

Example

```
12/14/00 12:46:01                        Seize/Lock Wait Statistics Summary                 Page    5
                                            Report type
*ALL
                                            Locks                       Seizes
Requestor's Job Name                     Count      Avg Length       Count      Avg Length
-------------------------------------    ------------- -------------   ------------- -------------
QPADEV000S SUSTAITA   012537                   2          7,927
QPADEV0006 SUSTAITA   012538                   2          6,061
Member LCKTRC1        Library TRACESVT    Period from 00.00.00
```

```
through 23.59.59          500 ms minimum wait


12/14/00 12:46:01                              Seize/Lock Wait
Statistics Summary                 Page    6
                                               Report type
*ALL
                                       Locks                          Seizes
Holder's Job Name                     Count       Avg Length       Count       Avg Length
-------------------------------------  -------------  -------------   -------------  -------------
QPADEV000R SUSTAITA   012535                 2         6,061
QPADEV0006 SUSTAITA   012538                 2         7,927
Member LCKTRC1        Library TRACESVT    Period from 00.00.00
through 23.59.59          500 ms minimum wait



12/14/00 12:46:01                              Seize/Lock Wait
Statistics Summary                 Page    7
                                               Report type
*ALL
Object                                 Locks                          Seizes
 Type   Object Name                   Count       Avg Length       Count       Avg Length
------  -------------------------------  -------------  -------------   -------------  -------------
PGM    QAVCPP     QPFR                      4         6,994
Member LCKTRC1        Library TRACESVT    Period from 00.00.00
through 23.59.59          500 ms minimum wait
```

Example: Batch Job Trace Report

This sample report shows the Job Summary section of the Batch Job Trace Report. This section of the report provides the number of traces, the number of I/O operations, the number of seize and lock conflicts, and the number of state transitions for each batch job.

Example

```
                                   Batch Job  Trace Report                          9/05/98 14:15:10
                                         Job Summary                                  Page 1
                                    Sample Job  Trace Report
Member  . . . : Q981421246 Model/Serial  . : 500-2142/10-1803D
Main storage . . : 128.0  M  Started . . . . : 05/22/98 12:47:35
  Library . . : THREAD1     System name . . :           ABSYSTEM
Version/Release :    4/ 2.0 Stopped . . . . : 05/22/98 12:52:38

  ----   Physical   ----    Seize   ---   State   ---    Job          User        Job           -- Job --    Number      CPU
  ----   I/O  Count  ----   and Lock  --- Transitions ---
   Name         Name       Number   Pool   Type  Pty   Traces   Util      Sync        Async      Conflicts    A-A        A-I
----------   ----------   ------   ----   ----  ---   ------   ----   ----------  ----------  ---------  ---------  ---------
QPFRMON      QPGMR        013842    02     B     0       5    11.7        604         235          0          1          0
Job Name                 -- Name of the job
User Name                -- User name
Job Number               -- Job number
Pool                     -- Pool in which the job ran
Job Type                 -- Job type and subtype
Job Pty                  -- Priority of the job
Number Traces            -- Number of traces
CPU Util                 -- Percentage of available CPU time used.  This is the average of all processors
Physical I/O Count
    Sync                 -- Number of synchronous I/O operations
    Async                -- Number of asynchronous I/O operations
Seize and Lock Conflicts -- Number of seize conflicts and lock waits
State Transitions A-A    -- Number of active-to-active transitions
State Transitions A-I    -- Number of active-to-ineligible transitions
```

Related reference

Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

Each report includes columns of information. Look here for descriptions of that information.

Example: Job Trace Information report

This sample report shows the QPPTTRCD file. The Print Job Trace (PRTJOBTRC) command generates printer files QPPTTRCD, QPPTTRC1 and QPPTTRC2.

The Job Trace Information report shows the job trace data that is collected with the STRJOBTRC and ENDJOBTRC commands.

Example

```
                                     JOB TRACE INFORMATION                                        PAGE    1
   FILE-QAPTTRCJ   LIBRARY-TRCTST    MBR-QAJOBTRC      JOB- QPADEV0058/RSRAYAS    /541176
TIME             THREAD   SEQNBR     FUNCTION  PROGRAM   LIBRARY    ENTRY  EXIT   INV    CPU         DB    NON-DB WRITTEN WAITS
11:48:21.252517 00000009 00000261   RETURN    QYPESVAC  QSYS       000012 000117 015    .048878      6    1033   1006     49
11:48:21.252534 00000009 00000262   CALL      QMHSNDPM  QSYS       000023 000001 016    .000433
11:48:21.252623 00000009 00000263   DATA                MESSAGE HANDLER SEND MESSAGE
                                     MESSAGE ID        -CPCAF07                       COMPLETION
                                     SEVERITY          -00                            CALL LEVEL       -0014
                                     PROGRAM           -QYPESTRP
                                     MODULE            -QYPESTRP
                                     PROCEDURE         -main
11:48:21.252648 00000009 00000264   RETURN    QMHSNDPM  QSYS       000024 0000B0 015    .006427
11:48:21.252661 00000009 00000265   CALL      QSYSAUDR  QSYS       00006A 000001 017    .000513
11:48:21.252724 00000009 00000270   CALL      QJOSNDJE  QSYS       000C51 000001 018    .002943
11:48:21.252760 00000009 00000271   RETURN    QJOSNDJE  QSYS       000C52 000230 017    .001728
11:48:21.252764 00000009 00000272   RETURN    QSYSAUDR  QSYS       00006F 00038B 016    .000033
11:48:21.252774 00000009 00000273   RETURN    QYPESTRP  QSYS       000000 0000AF 013    .000312
11:48:21.252779 00000009 00000274   RETURN    QYPESTRP  QSYS       000130 000000 012    .000189
11:48:21.252786 00000009 00000275   CALL      QMHMOVPM  QSYS       00013C 000001 013    .000277
```

Example: Job Trace Analysis Summary report

This sample report shows the QPPTTRC1 file. The Print Job Trace (PRTJOBTRC) command generates printer files QPPTTRCD, QPPTTRC1 and QPPTTRC2. The Trace Analysis Summary report (QPPTTRC1) shows the job trace details by transaction.

The Job Trace Analysis Summary report shows the number and type of I/O operations, such as database reads, non-database reads, and writes, that occurs for each transaction.

Example

```
                                     TRACE ANALYSIS SUMMARY                          08/18/2005
   FILE-QAPTTRCJ   LIBRARY-TRCTST    MBR-QAJOBTRC                  JOB- QPADEV0058/RSRAYAS    /541176
                              P H Y S I C A L   I / O
           SECONDS   CPU SECONDS  DB READS  NON-DB RDS    WRITES  WAITS    SEQUENCE
WAIT-ACT   1.590181                                                          36
ACTIVE     1.699944   6.271885                  19          2      1       16865
WAIT-ACT   1.699944   6.271885       6         1119       1013     60        58
ACTIVE      .480432   6.298743                                               85
WAIT-ACT    .480432   6.298743       6         1119       1013     60        474
ACTIVE     9.842661  15.677025                 127          4      2        173
WAIT-ACT   9.842661  15.677025       6         1246       1017     62       8757
ACTIVE      .616217  28.773849                1316                          4389
WAIT-ACT    .616217  28.773849       6         2562       1017     62       4394
ACTIVE      .000082  40.675719                  12                         8207
WAIT-ACT    .000082  40.675719       6         2574       1017     62       8211
ACTIVE      .000137  40.711058                   6                         8823
WAIT-ACT    .000137  40.711058       6         2580       1017     62       8828
ACTIVE      .000110  50.753111                   1                          257
WAIT-ACT    .000110  50.753111       6         2581       1017     62      12812
```

Example: Job Trace Analysis I/O Summary report

This sample report shows the QPPTTRC2 file. The Print Job Trace (PRTJOBTRC) command generates printer files QPPTTRCD, QPPTTRC1 and QPPTTRC2. The Trace Analysis I/O Summary report (QPPTTRC2) shows the job trace details by transaction.

The Job Trace Analysis I/O Summary report shows the number of IBM-supplied database modules, such as GETDR and GETSQ, used during the transaction, and the number of full and shared file opens and closes, the number of subfile operations, and the number of messages that occurred in the transaction.

```
                                  TRACE ANALYSIS I/O SUMMARY                    08/18/2005
    FILE-QAPTTRCJ  LIBRARY-TRCTST    MBR-QAJOBTRC                    JOB- QPADEV0058/RSRAYAS   /541176
                         P R O G R A M   ******* PROGRAM DATA BASE  I/O *******  FULL   SHARE    SUBFILE
               SECONDS  SEQNCE NAME    CALL INIT GETDR GETSQ GETKY GETM PUT PUTM  UDR OPN CLS OPN CLS READS WRITES MSGS
WAIT-ACT      1.590181      36
ACTIVE        1.699944   16865 QITMONCP                                                                             4
WAIT-ACT      1.699944      58
ACTIVE         .480432      85
WAIT-ACT       .480432     474
ACTIVE        9.842661     173 QITMONCP    3                                                                        6
WAIT-ACT      9.842661    8757
ACTIVE         .616217    4389                                                                                     10
WAIT-ACT       .616217    4394
ACTIVE         .000082    8207
WAIT-ACT       .000082    8211
ACTIVE         .000137    8823                                                                                      1
WAIT-ACT       .000137    8828
ACTIVE         .000110     257                                                                                      3
WAIT-ACT       .000110   12812
```

Example: Job Interval Report

There are five sections of a Job Interval report.

Related reference

Each report, regardless of the type or section, contains information in the header of the report that
identifies characteristics of the data. Look here for descriptions of the header information.

Each report includes columns of information. Look here for descriptions of that information.

Job Interval Report - Interactive Job Summary

The Interactive job summary section of the Job interval report lists one line for all selected interactive jobs
that existed during each selected interval (a total of one line per interval).

The information included in this section includes only valid interactive jobs with CPU activity other than
zero, or with any I/O activity.

Example

```
                                       Job Interval Report                          10/02/03
20:11:21
                                      Interactive Job Summary                          Page    1
                                 Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . . : ABSYSTEM
Version/Release .:   5/3.0   Stopped . . . : 10/02/03 16:00:00
Partition ID : 003         Feature Code  . : 7427-2498-7427
  Itv    Act     Tns      Rsp/  ----------------- Number of I/O --------------------   Tns/   CPU    PAG    Perm   Arith
  End   Jobs    Count      Tns    DDM      Sync      Async     Logical    Cmn          Hour   Util  Fault   Write   Ovrfl
 -----  ------  ----------  ------  ---------  ---------  ---------  ---------  ---------  ----------  -----  ------  -------  ------
14:00      2          5     .01       0        61        20           1         0          300    .0      0       11      0
14:01      1          0     .00       0         0         0           0         0            0    .0      0        0      0
14:02      1          0     .00       0        29        23           0         0            0    .0      0        7      0
14:03      3         29   77.29       0       779       340         158         0        1,740    .4      0      472      0
14:04      2          9     .44       0      2815       218           3         0          549   2.6      0      379      0
14:05      3          1     .23       0      2227       138          32         0           60   2.2      0      295      0
14:06      1          0     .00       0      1718       551         175         0            0   1.6      0     1052      0
14:07      1          0     .00       0      1989       754         219         0            0   2.3      0     1522      0
14:08      1          0     .00       0      1477       530         177         0            0   1.9      0     1133      0
14:09      1          0     .00       0      1985       756         228         0            0   2.5      0     1512      0
14:10      1          0     .00       0      2225       869         264         0            0   2.1      0     1722      0
14:11      1          0     .00       0      2309       882         269         0            0   2.3      0     1775      0
14:12      1          0     .00       0      2102       747         266         0            0   2.1      0     1586      0
14:13      1          0     .00       0      2276       860         271         0            0   2.4      0     1752      0
14:14      2         10     .06       0      1472       589          68         0          600   1.0      0      955      0
14:15      1          0     .00       0         0         0           0         0            0    .0      0        0      0
14:16      1          0     .00       0      2831      1657        7498         0            0   6.4      0     1669      0
14:17      1          0     .00       0      2567      1982       18192         0            0  11.5      0     2068      0
14:18      1          1  834.44       0       106        24           1         0           60    .0      0       67      0
14:21      1          2     .77       0        65         0           0         0          120    .0      0        0      0
```

14:25	1	1	.07	0	5	0	0	0	60	.0	0	0	0
14:26	2	78	.03	0	397	262	0	0	4,680	.1	0	0	0
14:27	1	20	.14	0	399	264	0	0	1,200	.0	0	1	0
14:28	2	63	.01	0	24	0	0	0	3,780	.0	0	0	0
14:29	2	3	2.16	0	541	227	0	0	183	.1	0	333	0

Itv End	-- Interval end time (hour and minute)
Act Jobs	-- Number of active jobs in the interval
Tns Count	-- Number of transactions
Rsp/Tns	-- Average response time (seconds)
DDM	-- Number of logical DB I/O operations for DM server jobs
Sync	-- Number of synchronous disk I/O operations
Async	-- Number of asynchronous disk I/O operations
Logical	-- Number of logical disk I/O operations
Cmn	-- Number of communications I/O operations
Tns/Hour	-- Average number of transactions per hour
CPU Util	-- Percentage of available CPU time used. This is the average of all processors
PAG Fault	-- Number of faults involving the Process Access Group
Perm Write	-- Number of permanent writes
Arith Ovrfl	-- Number of arithmetic overflow exceptions

Job Interval Report - Non-interactive Job Summary

The Non-interactive job summary section of the Job interval report lists one line for all selected non-interactive jobs that existed during each selected interval (a total of one line per interval).

The information included in this section includes only valid non-interactive jobs with CPU activity other than zero, or with any I/O activity.

Example

```
                               Job Interval Report                           10/02/03 20:11:21
                             Non-Interactive Job Summary                        Page    4
                          Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :  5/3.0   Stopped . . . : 10/02/03 16:00:00
Partition ID  : 003        Feature Code  . : 7427-2498-7427
```

Itv End	Act Jobs	CPU Util	Number of I/O Per Second				CPU/ I/O		Line Count	Page Count	PAG Fault	Perm Write	Arith Ovrflw
			Sync	Async	Logical	Cmn	Sync	Async					
14:00	1,634	96.2	97.5	74.0	888.5	.0	39	51	522	10	0	5,232	0
14:01	1,618	98.6	192.8	173.9	724.3	.0	20	22	576	11	0	10,615	2
14:02	1,620	98.5	228.7	217.5	867.9	.0	17	18	444	11	0	12,672	0
14:03	1,628	94.0	174.3	177.9	912.4	.0	21	21	726	14	0	9,609	0
14:04	1,616	93.6	123.5	92.1	1250.9	.0	30	40	479	7	0	6,664	0
14:05	1,631	97.0	74.0	51.3	624.4	.0	52	75	522	10	0	3,680	0
14:06	1,604	97.0	87.6	68.4	621.5	.0	44	56	591	13	0	4,740	0
14:07	1,622	93.7	144.7	108.7	997.6	.0	25	34	632	14	0	7,507	0
14:08	1,616	96.3	92.6	87.9	720.2	.0	41	43	523	10	0	5,247	0
14:09	1,631	95.0	388.9	287.8	1014.2	.0	9	13	3,005	76	0	17,536	0
14:10	1,612	95.6	360.4	363.8	849.8	.0	10	10	838	18	0	19,222	0
14:11	1,615	94.9	467.8	498.8	913.2	.0	8	7	522	10	0	25,912	0
14:12	1,619	96.0	303.1	323.3	669.0	.0	12	11	577	9	0	16,788	0
14:13	1,620	94.6	497.3	524.7	903.5	.0	7	7	631	14	0	27,895	0
14:14	1,614	96.0	333.0	368.9	987.9	.0	11	10	524	11	0	18,309	0
14:15	1,627	96.0	258.3	263.8	1042.6	.0	14	14	722	15	0	13,502	0
14:16	1,614	91.5	424.4	456.4	789.8	.0	8	8	485	10	0	23,855	0
14:17	1,578	86.0	460.3	502.1	800.9	.0	7	6	520	10	0	25,618	0
14:18	1,623	94.5	404.5	422.0	1237.5	.0	9	8	586	11	0	22,166	0
14:19	1,617	96.0	63.0	60.9	638.4	.0	60	63	480	9	0	3,461	0
14:20	1,612	98.4	19.5	16.6	315.2	.0	201	236	522	8	0	985	0
14:21	1,619	87.2	48.6	29.8	318.8	.0	71	117	493	10	0	2,020	0
14:22	1,621	96.1	435.5	429.6	1026.5	.0	8	8	586	12	0	22,950	0
14:23	1,620	97.9	337.1	347.5	759.4	.0	11	11	477	9	0	18,888	0
14:24	1,624	91.5	161.4	161.3	769.4	.0	22	22	610	14	0	8,667	0

Itv End	-- Interval end time (hour and minute)
Act Jobs	-- Number of jobs that were active during the interval
CPU Util	-- Percentage of available CPU time used. This is the average of all processors
Sync I/O Per Second	-- Average number of synchronous disk I/O operations per second
Async I/O Per Second	-- Average number of asynchronous disk I/O operations per second
Logical I/O Per Second	-- Average number of logical disk I/O operations per second
Cmn I/O Per Second	-- Average number of communications I/O operations per second
CPU/ Sync I/O	-- Avg number of CPU milliseconds per synchronous disk I/O operation
CPU/ Async I/O	-- Avg number of CPU milliseconds per asynchronous disk I/O operation
Line Count	-- Number of lines printed
Page Count	-- Number of pages printed
PAG Fault	-- Number of faults involving the Process Access Group
Perm Write	-- Number of permanent writes
Arith Ovrflw	-- Number of arithmetic overflow exceptions

Job Interval Report - Interactive Job Detail

The Interactive job detail section of the Job interval report displays detailed information by interval and job.

One line is printed for each selected interactive job that existed during each selected interval (generally more than one line per interval).

Example

```
                                        Job Interval Report                              10/02/03 20:11:21
                                      Interactive Job Detail                             Page    8
                                 Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :   5/3.0   Stopped . . . : 10/02/03 16:00:00
Partition ID : 003       Feature Code  . : 7427-2498-7427
                                            P                -------- Physical I/O Per Transaction --------       SYNC
   Itv     Job    User Name/ Job   Current  t  TNS  Rsp   CPU  ---- Synchronous ----- ---- Asynchronous ----  CPU  I/O
   End     Name    Thread   Number User    PL y  /HR /Tns  /Tns  DBR  DBW NDBR NDBW  DBR  DBW NDBR NDBW Util /Sec
 ----- ---------- --------- ------ -------- -- -- ---- ----- ------- ---- ---- ---- ---- ---- ---- ---- ---- ----- ------
 14:00 QPADEV002W FRY       955881 FRY      3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0   .0   1.0
 14:00 QPADEV006S CHEVURU   955956 CHEVURU  3 20  300  .01  .0040  .0   .0   .0   .0   .0   .0   .0   .0   .0    .0
 14:01 QPADEV002W FRY       955881 FRY      3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0   .0    .0
 14:02 QPADEV002W FRY       955881 FRY      3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0   .0    .4
 14:03 QPADEV001P PST       955783 PST      3 01  180  .06  .0600  .0   .0   .0   .0   .0   .0   .0   .0   .0    .0
 14:03 QPADEV002W FRY       955881 FRY      3 20 1260 106.43 .0370 1.0  4.0  7.6  7.3   .2  8.4   .3  6.1   .3  12.0
 14:03 QPADEV0031 FRY       956238 FRY      3 20  300 1.21  .0030  .0   .0   .2  7.0   .0   .0   .0  3.8   .0    .9
 14:04 QPADEV002W FRY       955881 FRY      3 20  122  .00 3.1060 155.5  5.0 999.9 108.0 13.0 14.0   .0 29.0  2.6  44.6
 14:04 QPADEV0031 FRY       956238 FRY      3 20  427  .56  .0080  .0   .0  4.4  6.0   .0   .0   .0 15.1   .0   3.0
 14:05 QPADEV002W FRY       955881 QNOTES   3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0  2.2  36.9
 14:04 QPADEV0031 FRY       956238 FRY      3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0   .0   3.6
 14:05 QPADEV004B V2KEA524  956014 V2KEA524 3 20   60  .23  .0910  .0   .0   .0   .0   .0   .0   .0   .0   .0    .0
 14:06 QPADEV002W FRY       955881 QNOTES   3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0  1.6  28.6
 14:07 QPADEV002W FRY       955881 QNOTES   3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0  2.3  33.1
 14:08 QPADEV002W FRY       955881 QNOTES   3 20    0  .00  .0000  .0   .0   .0   .0   .0   .0   .0   .0  1.9  24.6
Itv End                -- Interval end time (hour and minute)
Job Name               -- Job name
User Name/Thread       -- User name or secondary thread identifier
Job Number             -- Job number
Current User           -- User name under which the job was running at the end of the interval
PL                     -- Pool in which the job ran
Pty                    -- Priority of the job
TNS/HR                 -- Average number of transactions per hour
Rsp/Tns                -- Average response time (seconds)
CPU/Tns                -- Average number of CPU seconds per transaction
Physical I/O per Trans -- Average physical disk I/O per transaction
   Synchronous DBR     -- Average synchronous data base reads per transaction
   Synchronous DBW     -- Average synchronous data base writes per transaction
   Synchronous NDBR    -- Average synchronous non-data base reads per transaction
   Synchronous NDBW    -- Average synchronous non-data base writes per transaction
   Asynchronous DBR    -- Average asynchronous data base reads per transaction
   Asynchronous DBW    -- Average asynchronous data base writes per transaction
   Asynchronous NDBR   -- Average asynchronous non-data base reads per transaction
   Asynchronous NDBW   -- Average asynchronous non-data base writes per transaction
CPU Util               -- Percentage of available CPU time used.  This is the average of all processors
Sync I/O /Sec          -- Average number of synchronous disk I/O operations per second
```

Job Interval Report - Non-interactive Job Detail

The Non-interactive job detail section of the Job interval report displays detailed information by interval and job.

One line is printed for each selected non-interactive job that existed during each selected interval (generally more than one line per interval).

Example

```
                                        Job Interval Report                              10/02/03 20:11:21
                                    Non-Interactive Job Detail                           Page   14
                                 Perf data from 14:00 to 16:00 at 1 min
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :   5/3.0   Stopped . . . : 10/02/03 16:00:00
Partition ID : 003       Feature Code  . : 7427-2498-7427
```

Itv End	Job Name	User Name/ Thread	Job Number	Current User	Pool	Type	Pty	Elapsed Time	CPU Util	Sync	--- Nbr I/O /Sec --- Async	Lgl	-- CPU / I/O -- Sync	Async	---- Printer ---- Lines	Pages
14:00	ADMIN	QTMHHTTP	955725	QTMHHTTP	2	B	25	1:00	.00	0	0	0	0	0	0	0
14:00	ADMIN	QTMHHTTP	955727	QTMHHTTP	2	BD	25	1:00	.00	0	0	0	0	0	0	0
14:00	AMQPCSEA	QMQM	955757	QMQM	2	B	35	1:00	.00	0	0	0	0	0	0	0
14:00	AMQRMPPA	QMQM	955773	QMQM	2	B	35	1:00	.00	0	0	0	0	0	0	0
14:00	AMQRRMFA	QMQM	955752	QMQM	2	B	35	1:00	.00	0	0	0	0	0	0	0
14:00	AMQZDMAA	QMQM	955753	QMQM	2	B	35	1:00	.00	0	0	0	0	0	0	0
14:00	AMQZLAA0	QMQM	955755	QMQM	2	B	20	1:00	.00	0	0	0	0	0	0	0
14:00	AMQZLAA0	QMQM	955774	QMQM	2	B	20	1:00	.00	0	0	0	0	0	0	0
14:00	AMQZXMA0	QMQM	955749	QMQM	2	B	20	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953645	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953647	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953648	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953649	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953650	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953651	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953652	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953653	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953654	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953655	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953656	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953657	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953658	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953659	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953660	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0
14:00	CPUTEST	WLCPU	953662	WLCPU	2	B	51	1:00	.00	0	0	0	0	0	0	0

```
Itv End             -- Interval end time (hour and minute)
Job Name            -- Job name
User Name/Thread    -- User name or secondary thread identifier
Job Number          -- Job number
Current User        -- User name under which the job was running at the end of the interval
Pool                -- Pool in which the job ran
Type                -- Type and subtype of the job
Pty                 -- Priority of the job
Elapsed Time        -- Elapsed time for job during interval (minutes and seconds)
CPU Util            -- Percentage of available CPU time used.  This is the average of all processors
Sync I/O /Sec       -- Average number of synchronous disk I/O operations per second
Async I/O /Sec      -- Average number of asynchronous disk I/O operations per second
Lgl I/O /Sec        -- Average number of logical disk I/O operations per second
CPU/ Sync I/O       -- Avg number of CPU milliseconds per synchronous disk I/O operation
CPU/ Async I/O      -- Avg number of CPU milliseconds per asynchronous disk I/O operation
Printer Lines       -- Number of lines printed
Printer Pages       -- Number of pages printed
```

Job Interval Report - Selection Criteria

The Selection criteria section of the Job interval report shows the selection values you chose to produce the report.

Example

```
Select Parameters

Pools                     - 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16

Jobs                      - 012345/Useridwxyz/Jobname123 00000005
                            987654/Useridabcd/Jobname456 *ALL

User IDs                  - User1      User2      User3      User4      User5      User6
                            User7      User8      User9      User10     User11     User12

Subsystems                - Subsystem1 Subsystem2 Subsystem3 Subsystem4 Subsystem5 Subsystem6
                            Subsystem7 Subsystem8 Subsystem9 Subsystema Subsystemb Subsystemc

Communications Lines      - Line1      Line2      Line3      Line4      Line5      Line6
                            Line7      Line8      Line9      Line10     Line11     Line12

Control Units             - Ctlr1      Ctlr2      Ctlr3      Ctlr4      Ctlr5      Ctlr6
                            Ctlr7      Ctlr8      Ctlr9      Ctlr10     Ctlr11     Ctlr12

Functional Areas          - Accounting            Payroll               Research
                            Development           ProjectX              MrNolansStaff

                          - No Select parameters were chosen.
```

```
Omit Parameters

Pools                      - 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16

Jobs                       - 012345/Useridwxyz/Jobname123 00000005
                             987654/Useridabcd/Jobname456 *ALL

User IDs                   - User1      User2      User3      User4      User5      User6
                             nnnnnn     User8      User9      User10     User11     User12

Subsystems                 - Subsystem1 Subsystem2 Subsystem3 Subsystem4 Subsystem5 Subsystem6
                             Subsystem7 Subsystem8 Subsystem9 Subsystema Subsystemb Subsystemc

Communications Lines       - Line1      Line2      Line3      Line4      Line5      Line6
                             Line7      Line8      Line9      Line10     Line11     Line12

Control Units              - Ctlr1      Ctlr2      Ctlr3      Ctlr4      Ctlr5      Ctlr6
                             Ctlr7      Ctlr8      Ctlr9      Ctlr10     Ctlr11     Ctlr12

Functional Areas           - Accounting           Payroll              Research
                             Development           ProjectX             MrNolansStaff

                           - No Omit parameters were chosen.
```

Example: Pool Interval Report

There are two sections to the Pool Interval Report.

Related reference

"Performance Report header" on page 10

Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

"Performance Report columns" on page 59

Each report includes columns of information. Look here for descriptions of that information.

Pool Interval Report - Subsystem Activity

The Subsystem activity section of the Pool interval report displays the performance information on the subsystems during each selected interval.

One line is printed for each subsystem and active pool combination that existed during each selected interval. Changes to this section of the report include:

- The CPU Util (Average CPU utilization by the transactions in the pool) column is expanded by 1 decimal position to show more precision.
- The following columns are expanded by 1 space, in order to show values up to 9999.9:
  - Synchronous DBR
  - Synchronous DBW
  - Synchronous NDBR
  - Synchronous NDBW
  - Asynchronous DBR
  - Asynchronous DBW
  - Asynchronous NDBR
  - Asynchronous NDBW
- The A-W (Most active-to-wait transitions) column is expanded by 1 space in order to show values up to 6 digits.

Example

```
                                          Pool Interval Report                              08/30/05 12:18:33
                                           Subsystem Activity                                        Page   1
 Member . . . : PTFVTR54   Model/Serial  . : 825/10-D0BFD      Main storage  . . : 3072.0 MB Started . . . : 08/05/05 09:00:01
 Library . . : PTFVTR54    System name . . : MEXGPL08          Version/Release . :     5/4.0 Stopped . . . : 08/05/05 11:00:00
 Partition ID : 001        Feature Code  . : 7418-2473-7418
                                    --------- Physical I/O per Transaction -------- --------------- Job Maximums ----------------
   Itv  Subsystem         CPU          ----- Synchronous ----- ---- Asynchronous ----- CPU     Phy                          Job Maximums
   End  Name         PL  Util    Tns   DBR   DBW   NDBR  NDBW  DBR   DBW   NDBR  NDBW   Util    I/O     Tns    Rsp   A-W   W-I  A-I
 ----- ---------- -- ----- -------- ----- ----- ----- ----- ----- ----- ----- ----- ----- ---------- ----- ------ ------ ---- ----
 09:00 BLDTESTSS   2   .00      0                                                       .0         0      0    .00      2    0    0
 09:00 JESUSESS    2   .00      0                                                       .0         0      0    .00      2    0    0
 09:00 QINTER      3   .00      0                                                       .0         0      0    .00      1    0    0
 09:00 QSERVER     2   .00      0                                                       .0         0      0    .00      1    0    0
 09:00 QSYSWRK     2  1.89      0                                                      11.5       140      0    .00    258    0    0
 09:01 BLDSHIPSS   2   .00      0                                                       .0         0      0    .00      4    0    0
 09:01 BLDTESTSS   2   .00      0                                                       .0         0      0    .00      2    0    0
 09:01 JESUSESS    2   .00      0                                                       .0         0      0    .00      4    0    0
 09:01 QINTER      3   .00      0                                                       .0         0      0    .00      2    0    0
 09:01 QSERVER     2   .00      0                                                       .0         0      0    .00      1    0    0
 09:01 QSNADS      2   .00      0                                                       .0         0      0    .00      1    0    0
 09:01 QSYSWRK     2   .28      0                                                       .0        43      0    .00    233    0    0
 09:01 BLDSHIPSS   2   .00      0                                                       .0         0      0    .00      2    0    0
 09:01 BLDTESTSS   2   .00      0                                                       .0         0      0    .00      4    0    0
 09:01 JESUSESS    2   .00      0                                                       .0         0      0    .00      2    0    0
 09:01 QINTER      3   .00      0                                                       .0         0      0    .00      2    0    0
 09:01 QSERVER     2   .00      0                                                       .0         0      0    .00      1    0    0
 09:01 QSYSWRK     2  1.38      0                                                       .9      6575      0    .00    285    0    0


 Itv End                   -- Interval end time (hour and minute)
 Subsystem Name            -- Subsystem name
 PL                        -- Pool in which the jobs in the subsystem ran
 CPU Util                  -- Average CPU utilization by the transactions in the subsystem.  This is the average  of all processors
 Tns                       -- Number of transactions in the subsystem
 Physical I/O per Trans    -- Average physical disk I/O operations per transaction
    Synchronous DBR        -- Average synchronous data base reads per transaction
    Synchronous DBW        -- Average synchronous data base writes per transaction
    Synchronous NDBR       -- Average synchronous non-data base reads per transaction
    Synchronous NDBW       -- Average synchronous non-data base writes per transaction
    Asynchronous DBR       -- Average asynchronous data base reads per transaction
  Asynchronous DBW         -- Average asynchronous data base writes per transaction
  Asynchronous NDBR        -- Average asynchronous non-data base reads per transaction
  Asynchronous NDBW        -- Average asynchronous non-data base writes per transaction
 Job Maximums              -- Maximum values by a job in the subsystem
    CPU Util               -- Highest percentage CPU utilization
    Phy I/O                -- Most physical disk I/O requests
    Tns                    -- Most transactions
    Rsp                    -- Highest average response time (seconds)
    A-W                    -- Most active-to-wait transitions
    W-I                    -- Most wait-to-ineligible transitions
    A-I                    -- Most active-to-ineligible transitions
```

Pool Interval Report - Pool Activity

The Pool activity section of the Pool interval report displays the performance information on the storage pools at various time intervals.

One line is printed for each active pool that existed during each selected interval. Changes to this section of the report include:

- The Size column values are now expressed in gigabytes.
- The CPU Util (Average CPU utilization by the transactions in the pool) column is expanded by 1 decimal position to show more precision.
- The following columns are expanded by 1 space, in order to show values up to 9999.9:
  - Synchronous DBR
  - Synchronous DBW
  - Synchronous NDBR
  - Synchronous NDBW
  - Asynchronous DBR
  - Asynchronous DBW
  - Asynchronous NDBR

| • The A-W (Most active-to-wait transitions) column is expanded by 1 space in order to show values up to
| 6 digits.

Example

```
                                           Pool Interval Report                              08/30/05 12:18:33
                                             Pool Activity                                            Page  45
   Member  . . . : PTFVTR54    Model/Serial  . : 825/10-D0BFD    Main storage  . . : 3072.0 MB Started . . . : 08/05/05 09:00:01
     Library . . : PTFVTR54    System name . . : MEXGPL08        Version/Release . :    5/4.0 Stopped . . . : 08/05/05 11:00:00
   Partition ID : 001          Feature Code  . : 7418-2473-7418
                                        -------- Physical I/O per Transaction --------- -------------- Job Maximums --------------
   Itv       Act  Size  CPU          ----- Synchronous ----- ----- Asynchronous ---- CPU    Phy
   End  PL   Lvl  (GB)  Util    Tns  DBR   DBW   NDBR  NDBW  DBR   DBW   NDBR  NDBW Util    I/O    Tns   Rsp    A-W    W-I  A-I
   ----- -- ----- ----- ----- -------- ----- ----- ----- ----- ----- ----- ----- ----- ----- ------- ----- ------ ------ ---- ----
   09:00  2  112  2.388  1.90        0                                              11.5    140    0    .00    258    0    0
   09:00  3   75   .292   .00        0                                                .0      0    0    .00      1    0    0
   09:01  2  112  2.388   .29        0                                                .0     43    0    .00    233    0    0
   09:01  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:01  2  112  2.388  1.39        0                                                .9   6575    0    .00    285    0    0
   09:01  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:02  2  112  2.388   .39        0                                                .1    304    0    .00    234    0    0
   09:02  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:02  2  112  2.388   .51        0                                                .1    275    0    .00    272    0    0
   09:02  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:03  2  112  2.388   .38        0                                                .0    298    0    .00    235    0    0
   09:03  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:03  2  112  2.388   .53        0                                                .1    298    0    .00    266    0    0
   09:03  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:04  2  112  2.388   .37        0                                                .0    291    0    .00    235    0    0
   09:04  3   75   .292   .00        0                                                .0      0    0    .00      2    0    0
   09:04  2  112  2.388   .52        0                                                .1    257    0    .00    258    0    0

   Itv End                    -- Interval end time (hour and minute)
   PL                         -- Pool identifier
   Act Lvl                    -- Activity level of the pool
   Size (GB)                  -- Size of the pool (Gigabytes)
   CPU Util                   -- Average CPU utilization by the transactions in the pool.  This is the average  of all processors
   Tns                        -- Number of transactions in the pool
   Physical I/O per Trans     -- Average physical disk I/O operations per transaction in the pool
       Synchronous DBR        -- Average synchronous data base reads per transaction
       Synchronous DBW        -- Average synchronous data base writes per transaction
       Synchronous NDBR       -- Average synchronous non-data base reads per transaction
       Synchronous NDBW       -- Average synchronous non-data base writes per transaction
       Asynchronous DBR       -- Average asynchronous data base reads per transaction
       Asynchronous DBW       -- Average asynchronous data base writes per transaction
       Asynchronous NDBR      -- Average asynchronous non-data base reads per transaction
       Asynchronous NDBW      -- Average asynchronous non-data base writes per transaction
   Job Maximums               -- Maximum values by a job in the pool
       CPU Util               -- Highest percentage CPU utilization
       Phy I/O                -- Most physical disk I/O requests
       Tns                    -- Most transactions
       Rsp                    -- Highest average response time (seconds)
       A-W                    -- Most active-to-wait transitions
       W-I                    -- Most wait-to-ineligible transitions
       A-I                    -- Most active-to-ineligible transitions
```

Example: Resource Interval Report

There are six sections to the Resource interval report.

Related reference

The IOP Utilizations section of the Resource Interval Report contains a combination of input/output
processor (IOP) utilizations

The Local work station response times section of the Resource interval report provides the information
for each data collection interval.

The Remote work station response times section of the Resource interval report provides information
for each data collection interval.

Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

Each report includes columns of information. Look here for descriptions of that information.

Resource Interval Report - Disk Utilization Summary

The Disk Utilization summary of the Resource interval report displays detailed disk information by time intervals.

Information is shown for all disk arms that are configured on the system. Also, the disk arm with the highest utilization and the disk arm with the highest average seek time for each time interval are shown. Consistent disk arm utilization at or above the threshold value will affect system performance and cause longer response times and/or less throughput. Changes to this section of the report include:

- The values under the Disk Space Used column are now expressed in gigabytes.

Example

```
                                          Resource Interval Report                                    08/30/05 13:20:51
                                            Disk Utilization Summary                                          Page    1
       Member  . . . : PTFVTR54    Model/Serial  . : 825/10-D0BFD    Main storage  . . : 3072.0 MB Started . . . : 08/05/05 09:00:01
         Library . . : PTFVTR54    System name . . : MEXGPL08        Version/Release . :    5/4.0 Stopped . . . : 08/05/05 11:00:00
       Partition ID  : 001         Feature Code  . : 7418-2473-7418
                                     Average    Average    Average                   High   High   High    Disk
         Itv       Average          Reads      Writes      K Per     Avg    High     Util   Srv    Srv    Space
         End       I/O /Sec         /Sec       /Sec        I/O       Util   Util     Unit   Time   Unit   Used (GB)
       -----     ---------        --------    --------    -------   -----   -----    ----   -----  ----   -----------
       09:05        29.2             3.5        25.7        6.6       .7     1.4     0003   .0012  0003     92.776
       09:10        10.8              .8         9.9        7.7       .3      .6     0002   .0017  0002     92.782
       09:15        10.6              .8         9.7        7.8       .2      .3     0003   .0008  0003     92.788
       09:20        10.9             1.0         9.9        7.7       .0      .1     0002   .0004  0002     92.795
       09:25        21.5             7.2        14.3        9.3      1.1     1.6     0001   .0022  0001     92.822
       09:30        18.3             4.2        14.1       10.3       .5      .6     0001   .0014  0001     92.829
       09:35        18.6             7.6        11.0        7.1       .6     1.0     0001   .0014  0001     92.857
       09:40        36.5             8.7        27.7        6.9      1.3     1.6     0003   .0017  0003     92.811
       09:45        19.6             3.4        16.1        7.3       .3      .8     0001   .0012  0001     92.818
       09:50        10.6             1.1         9.4        7.8       .3     1.0     0001   .0033  0001     92.835
       09:55        10.0              .8         9.2        8.0       .3      .8     0001   .0026  0001     92.841
       10:00        53.8            14.8        38.9        8.4      1.6     2.1     0001   .0015  0001     92.892
       10:05        37.0            16.4        20.5       10.3      1.8     2.1     0001   .0025  0001     92.903
       10:10       224.0           138.7        85.2        8.9     14.1    14.8     0001   .0022  0001     92.913
       10:15        66.4            22.1        44.2       11.9      1.5     3.0     0003   .0009  0003     92.974
       10:20       166.5            33.0       133.4        7.8      2.8     4.3     0003   .0006  0003     92.980
       10:25       161.9            41.5       120.3        9.2      3.3     5.1     0003   .0007  0003     92.957
       10:30        24.8             8.7        16.0       10.4      1.3     1.5     0003   .0022  0001     93.018
       10:35        13.9             4.0         9.9        8.6       .9     1.3     0003   .0028  0003     93.060
       10:40        23.9             8.0        15.8        8.7       .7     1.3     0003   .0014  0003     93.075
       10:45        14.1             3.4        10.7        8.3       .6      .8     0003   .0017  0003     92.988
       10:50        43.8            12.4        31.3        7.4       .6      .8     0001   .0008  0001     92.982
       10:55        29.9             2.8        27.1        8.4       .5      .8     0002   .0007  0002     93.008
       11:00        31.0             4.3        26.7        5.8       .5      .8     0003   .0000  0003     92.999
                 ---------        --------    --------    -------   -----
       Average:     45.3            14.6        30.7        8.6      1.5

       Itv End              -- Interval end time (hour and minute)
       Average Phys I/O /Sec -- Average number of physical I/O operations per second
       Average Reads / Sec  -- Average number of physical reads per second
       Average Writes /Sec  -- Average number of physical writes per second
       Average K Per I/O    -- Average number of kilobytes (1024) per I/O operation
       Avg Util             -- Average percent utilization of all disk arms
       High Util            -- Highest percent utilization for a disk arm
       High Util Unit       -- Disk arm with the highest utilization percent
       High Srv Time        -- Highest average service time in seconds
       High Srv Unit        -- Disk arm with the highest service time
       Disk Space Used      -- Total disk space used in Gigabytes (1024)
```

Resource Interval Report - Disk Utilization Detail

The Disk Utilization Detail section of the Resource interval report displays detailed disk information for the selected time intervals.

Information is shown for each disk arm that is configured on the system. Consistent disk arm utilization at or above the threshold value affects system performance and causes longer response times or less throughput.

Note: A plus (+) sign displays next to the Unit column to identify multipath disk units.

Example

```
                                    Resource Interval Report                              10/03/03 15:24:49
                                     Disk Utilization Detail                                   Page    3
                                      Multipath disk data
 Member  . . . : Q119115948 Model/Serial  . : 840/10-3A6HM
 Main storage  . . : 1024.0 GB Started . . . : 04/29/03 11:59:48
   Library . . : MPLIB       System name . . : ABSYSTEM
 Version/Release . :     5/3.0 Stopped . . . : 04/30/03 00:00:00
  Partition ID  : 001      Feature Code  . : 23FE-2420-1546
          IOP Name/       ASP Rsc   ASP  Itv   --------- I/O Per Second ---------   K Per  Dsk CPU          Queue  Avg Time Per I/O
   Unit   (Model)          Name     Id   End    Total      Reads      Writes       I/O    Util   Util   Length Service   Wait
   ----   ----------------- ---------- --- ----  ----------  ---------  ---------   -------  ------- -----  ------- -------  -----
 + 0004  CMB08    (2105)              5 12:15    .000       .000       .000        .0     11.4    .0    .00    .0000   .0000
                                        12:15    .000       .000       .000        .0      9.0    .0    .00    .0000   .0000
                                        12:15    .000       .000       .000        .0     21.0    .0    .00    .0000   .0000
                                        12:30    .000       .000       .000        .0      6.7    .0    .00    .0000   .0000
                                        12:30    .000       .000       .000        .0      6.7    .0    .00    .0000   .0000
                                        12:30    .000       .000       .000        .0      6.7    .0    .00    .0000   .0000
                                        12:45    .000       .000       .000        .0      9.0    .0    .00    .0000   .0000
                                        12:45    .000       .000       .000        .0      9.0    .0    .00    .0000   .0000
                                        12:45    .000       .000       .000        .0      6.6    .1    .00    .0000   .0000
                                        13:00    .000       .000       .000        .0     16.2    .0    .00    .0000   .0000
                                        13:00    .000       .000       .000        .0     13.8    .0    .00    .0000   .0000
                                        13:00    .000       .000       .000        .0      9.0    .1    .00    .0000   .0000
                                        13:15    .000       .000       .000        .0     11.4    .0    .00    .0000   .0000
                                        13:15    .000       .000       .000        .0      9.0    .0    .00    .0000   .0000
                                        13:15    .000       .000       .000        .0      6.6    .0    .00    .0000   .0000
                                        13:30    .000       .000       .000        .0      9.2    .0    .00    .0000   .0000
                                        13:30    .000       .000       .000        .0      6.8    .0    .00    .0000   .0000
 Unit                 -- Disk arm identifier
 IOP Name/            -- Input/Output processor resource name and
 (Model)                 model number of the attached device
 ASP Rsc Name         -- ASP resource name to which the disk unit was
                         allocated at collection time
 ASP ID               -- Auxiliary storage pool number
 Itv End              -- Interval end time (hour and minute)
 I/O /Sec             -- Average number of I/O operations per second
 Reads Per Second     -- Average number of reads per second
 Writes Per Sec       -- Average number of writes per second
 K Per I/O            -- Average number of kilobytes (1024) per I/O operation
 Dsk CPU Util         -- Percentage of Disk CPU Utilization
 Util                 -- Average percent of time disk was used (busy)
 Queue Length         -- Average length of waiting queue
 Average Service Time -- Average disk service time per I/O operation
 Average Wait Time    -- Average disk wait time per I/O operation

 + Multipath disk unit.
```

Resource Interval Report - Communications Line Detail

The Communications Line detail section of the Resource interval report contains information about the line activity when performance data was collected for the specified member.

One detail section is produced for each protocol in use on the lines for which data was collected. Refer to the following for samples of the detail sections for these communications protocols:

Note: Each section appears only if you have communications lines using that particular protocol.

SDLC Protocol

This report section for communications lines using the synchronous data link control (SDLC) protocol is shown below. The data in this example is sorted by the data collection interval end times.

Example

```
                                    Resource Interval Report                              09/18/98 14:06:00
                                    Communications Line Detail                                 Page    3
                                  Sample Resource Interval Report
```

```
Member   . . . : PMISTGA1   Model/Serial  . : 500-2142/10-1803D
Main storage  . . : 128.0 M    Started . . . : 08/11/98 13:09:04
  Library . . : PM42CRT    System name . . :           ABSYSTEM
Version/Release . :  4/2.0   Stopped . . . : 08/11/98 13:38:40
PROTOCOL = SDLC (SORT BY INTERVAL)
```

Itv End	IOP Name/ Line	Line Speed	Line Util	Bytes Trnsmitd Per Sec	Total I Frames Trnsmitd	Percent I Frames Trnsmitd in Error	Bytes Recd Per Sec	Total Frames Recd	Percent Frames Received in Error	Pct Poll Retry Time	Congestion Local Not Ready	Remote Not Ready
	CC09 (2609)											
13:14	PMSD1	19.2	4.6	49	322	0	62	2,909	0	0	0	0
13:19	PMSD1	19.2	4.4	47	301	0	60	2,943	0	0	0	0
13:24	PMSD1	19.2	5.4	56	399	0	73	2,889	0	0	0	0
13:29	PMSD1	19.2	4.0	52	159	0	45	3,029	0	0	0	0
13:34	PMSD1	19.2	4.1	54	131	0	43	3,074	0	0	0	0
13:38	PMSD1	19.2	5.9	81	206	0	61	2,762	0	0	0	0
	CC13 (2609)											
13:14	PMSD2	19.2	4.6	63	160	0	49	3,044	0	0	0	0
13:19	PMSD2	19.2	4.4	60	151	0	47	3,072	0	0	0	0
13:24	PMSD2	19.2	5.4	73	200	0	56	3,055	0	0	0	0
13:29	PMSD2	19.2	4.0	45	226	0	52	2,971	0	0	0	0
13:34	PMSD2	19.2	4.1	43	263	0	55	2,966	0	0	0	0
13:38	PMSD2	19.2	5.9	61	411	0	80	2,587	0	0	0	0

X.25 Protocol

This sample of the report section for communications lines uses the X.25 protocol.

Example

```
                        Resource Interval Report                      10/03/03 12:42:33
                       Communications Line Detail                          Page  28
                     Perf data from 14:00 to 16:00 at 1 min
Member   . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB    Started . . . : 10/02/03 14:00:00
  Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :  5/3.0   Stopped . . . : 10/02/03 16:00:00
Partition ID  : 003        Feature Code  . : 7427-2498-7427
PROTOCOL = X.25 (SORT BY INTERVAL)
```

Itv End	IOP Name/ Line	Line Speed	Transmit/ Receive/ Average Line Util	Bytes Trnsmitd Per Sec	Total I Frames Trnsmitd	Percent I Frames Trnsmitd In Error	Bytes Recd Per Sec	Total Frames Recd	Percent Frames Recd In Err	Reset Packets Trnsmitd	Recd
	CMB07 (2742)										
14:00	DPNX25C	64.0	00/00/00	0	0	0	1	20	0	0	0
14:00	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:01	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0
14:01	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:02	DPNX25C	64.0	00/00/00	0	0	0	1	20	0	0	0
14:02	DPNX25B	64.0	00/00/00	0	0	0	1	20	0	0	0
14:03	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0
14:03	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:04	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0
14:04	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:05	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0
14:05	DPNX25B	64.0	00/00/00	0	0	0	1	20	0	0	0
14:06	DPNX25C	64.0	00/00/00	0	0	0	1	20	0	0	0
14:06	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:07	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0
14:07	DPNX25B	64.0	00/00/00	0	0	0	1	20	0	0	0
14:08	DPNX25C	64.0	00/00/00	0	0	0	1	20	0	0	0
14:08	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:09	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0
14:09	DPNX25B	64.0	00/00/00	0	0	0	1	19	0	0	0
14:10	DPNX25C	64.0	00/00/00	0	0	0	1	19	0	0	0

```
Itv End               -- End time of the data collection interval or time vary off occurred
IOP Name/Line         -- IOP resource name and model number, Line ID
Line Speed            -- Line speed (1000 bits per second)
Transmit/Receive/     -- In full duplex mode, the percent of transmit line capacity
  Average Line Util      used, the percent of receive line capacity used, and the
                         average of transmit/receive capacity
Bytes Trnsmitd        -- Average number of bytes transmitted per second
  Per Sec
Total I Frames        -- Number of I frames transmitted
Percent I Frames      -- Percent I frames transmitted in error
  Trnsmitd in Error
Bytes Recd Per Sec    -- Average number of bytes received per second
Total Frames Recd     -- Number of frames received
```

Percent Frames   -- Percent frames received in error
 Recd in Error
Reset Packets Trnsmitd -- Number of reset packets transmitted
Reset Packets Recd   -- Number of reset packets received

TRLAN Protocol

This sample of the report section for communications lines uses the token-ring local area network
(TRLAN) protocol.

Example

```
                                    Resource Interval Report                              10/03/03 12:42:33
                                   Communications Line Detail                                     Page  56
                                 Perf data from 14:00 to 16:00 at 1 min
 Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
    Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :   5/3.0   Stopped . . . : 10/02/03 16:00:00
 Partition ID  : 003      Feature Code  . : 7427-2498-7427
 PROTOCOL = TRLAN/H  (SORT BY INTERVAL)
                                                       ------- Congestion -------
          IOP                   I Frames   I Frames  -- Local --  -- Remote --              Rsp    Remote LAN
    Itv   Name/      Line  Line  Trnsmitd   Recd     Not   Seq    Not   Seq    Frame     Timer   -- Pct Frames --   MAC
    End   Line       Speed Util  Per Sec   Per Sec   Ready Error  Ready Error  Retry     Ended   Trnsmitd  Recd  Errors
   -----  ---------- ----- ----- --------- --------- ----- -----  ----- -----  -------   ------  --------  ----  ------
          CMB07
          (2744)
   14:00  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      97      6
   14:01  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      98      5
   14:02  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      99      6
   14:03  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      93      6
   14:04  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      95      6
   14:05  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      98      6
   14:06  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      96      6
   14:07  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100     100      6
   14:08  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      97      5
   14:09  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      99      6
   14:10  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      97      6
   14:11  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      97      6
   14:12  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      94      6
   14:13  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      90      6
   14:14  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      98      6
   14:15  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      95      6
   14:16  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      99      5
   14:17  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      98      6
   14:18  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      98      6
   14:19  NTRN64BA   16000.0  .0       0         0     0     0      0     0      0         0       100      97      6
 Itv End                   -- End time of the data collection interval or time vary off occurred
 IOP Name/Line             -- IOP resource name and model number, Line ID
 Line Speed                -- Line speed (1000 bits per second)
 Line Util                 -- Percent of available line capacity used in this interval
 I Frames Trans /Sec       -- Number of I frames transmitted per second
 I Frames Recd /Sec        -- Number of I frames received per second
 Local Not Ready           -- Percent of the interval that the system could not process incoming data
 Local Seq Error           -- Percent of the interval that the system received frames out of sequence
 Remote Not Ready          -- Percent of the interval that the remote system or device could not process incoming data
 Remote Seq Error          -- Percent of the interval that the remote system or device received frames out of sequence
 Frame Retry               -- The number of attempts to retransmit a frame to a remote controller
 Rsp Timer Ended           -- The number of times the response timer ended waiting for a response from a remote device
 Remote LAN Frames Trans   -- Percent of frames transmitted to a LAN connected to the locally attached LAN
 Remote LAN Frames Recd    -- Percent of frames received from a LAN connected to the locally attached LAN
 MAC Errors                -- The number of medium access control errors
```

ELAN Protocol

This sample of the report section for communications lines uses the Ethernet local area network (ELAN)
protocol.

Example

```
                                    Resource Interval Report                              10/03/03 12:42:33
                                   Communications Line Detail                                     Page  71
                                 Perf data from 14:00 to 16:00 at 1 min
 Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
    Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :   5/3.0   Stopped . . . : 10/02/03 16:00:00
 Partition ID  : 003      Feature Code  . : 7427-2498-7427
 PROTOCOL = ELAN/H  (SORT BY INTERVAL)
                                                       ------------- Congestion --------------
```

Itv End	IOP Name/ Line	Line Speed	Line Util	I Frames Trnsmitd Per Sec	I Frames Recd Per Sec	----- Local ----- Not Ready	Seq Error	----- Remote ----- Not Ready	Seq Error	Frame Retry	Rsp Timer Ended
	CMB02 (268C)										
14:00	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:01	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:02	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:03	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:04	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:05	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:06	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:07	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:08	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:09	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:10	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:11	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:12	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:13	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:14	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:15	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:16	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:17	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:18	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:19	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:20	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:21	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0
14:22	VGIBETH0	1000000.0	.0	0	0	0	0	0	0	0	0

```
Itv End              -- End time of the data collection interval or time vary off occurred
IOP Name/Line        -- IOP resource name and model number, Line ID
Line Speed           -- Line speed (1000 bits per second)
Line Util            -- Percent of available line capacity used in this interval
I Frames Trans /Sec  -- Number of I frames transmitted per second
I Frames Recd /Sec   -- Number of I frames received per second
Local Not Ready      -- Percent of the interval that the system could not process incoming data
Local Seq Error      -- Percent of the interval that the system received frames out of sequence
Remote Not Ready     -- Percent of the interval that the remote system or device could not process incoming data
Remote Seq Error     -- Percent of the interval that the remote system or device received frames out of sequence
Frame Retry          -- The number of attempts to retransmit a frame to a remote controller
Rsp Timer Ended      -- The number of times the response timer ended waiting for a response from a remote device
```

DDI Protocol

This sample of the report section for communications lines uses the distributed data interface (DDI) protocol.

Example

```
                              Resource Interval Report                      09/18/98 14:06:00
                              Communications Line Detail                     Page  12
                              Sample Resource Interval Report
  Member  . . . : PMISTGA1   Model/Serial  . : 500-2142/10-1803D
Main storage  . . : 128.0 M   Started . . . : 08/11/98 13:09:04
    Library . . : PM42CRT     System name . . :          ABSYSTEM
Version/Release . :   4/2.0   Stopped . . . : 08/11/98 13:38:40
  PROTOCOL = DDI (SORT BY INTERVAL)
```

Itv End	IOP Name/ Line	Line Speed	Line Util	I Frames Trnsmitd Per Sec	I Frames Recd Per Sec	------- Congestion ------- -- Local -- Not Ready	Seq Error	-- Remote -- Not Ready	Seq Error	Frame Retry	Rsp Timer Ended	MAC Errors
	CC01 (2618)											
13:14	PMDD1	100000.0	.0	3	3	0	0	0	0	0	0	0
13:19	PMDD1	100000.0	.0	0	0	0	0	0	0	0	0	0
13:24	PMDD1	100000.0	.0	2	2	0	0	0	0	0	0	0
13:29	PMDD1	100000.0	.0	0	0	0	0	0	0	0	0	0
13:34	PMDD1	100000.0	.0	1	1	0	0	0	0	0	0	0
13:38	PMDD1	100000.0	.0	0	0	0	0	0	0	0	0	0
	CC02 (2618)											
13:14	PMDD2	100000.0	.0	3	3	0	0	0	0	0	0	0
13:19	PMDD2	100000.0	.0	0	0	0	0	0	0	0	0	0
13:24	PMDD2	100000.0	.0	2	2	0	0	0	0	0	0	0
13:29	PMDD2	100000.0	.0	0	0	0	0	0	0	0	0	0
13:34	PMDD2	100000.0	.0	1	1	0	0	0	0	0	0	0
13:38	PMDD2	100000.0	.0	0	0	0	0	0	0	0	0	0

FRLY Protocol

This sample of the report section for communications lines uses the frame relay (FRLY) protocol.

Example

```
Member  . . . : PMISTGA1   Model/Serial  . : 500-2142/10-1803D
Main storage  . . : 128.0 M   Started . . . : 08/11/98 13:09:04
   Library . . : PM42CRT     System name . . :              ABSYSTEM
Version/Release . :   4/2.0   Stopped . . . : 08/11/98 13:38:40
PROTOCOL = FRLY (SORT BY INTERVAL)
```

| | | | | | | ------- Congestion ------- | | | | | | |
| Itv | IOP Name/ | Line | Line | I Frames Trnsmitd | I Frames Recd | -- Local -- | | -- Remote -- | | Frame | Rsp Timer | MAC |
End	Line	Speed	Util	Per Sec	Per Sec	Not Ready	Seq Error	Not Ready	Seq Error	Retry	Ended	Errors
	CC10 (2666)											
13:14	PMFR1	56.0	.0	0	0	0	0	0	0	0	0	0
13:19	PMFR1	56.0	.0	0	0	0	0	0	0	0	0	0
13:24	PMFR1	56.0	.0	0	0	0	0	0	0	0	0	0
13:29	PMFR1	56.0	.0	0	0	0	0	0	0	0	0	0
13:34	PMFR1	56.0	.0	0	0	0	0	0	0	0	0	0
13:38	PMFR1	56.0	.0	0	0	0	0	0	0	0	0	0
	CC11 (2666)											
13:14	PMFR2	56.0	.0	0	0	0	0	0	0	0	0	0
13:19	PMFR2	56.0	.0	0	0	0	0	0	0	0	0	0
13:24	PMFR2	56.0	.0	0	0	0	0	0	0	0	0	0
13:29	PMFR2	56.0	.0	0	0	0	0	0	0	0	0	0
13:34	PMFR2	56.0	.0	0	0	0	0	0	0	0	0	0
13:38	PMFR2	56.0	.0	0	0	0	0	0	0	0	0	0

ASYNC Protocol

This sample of the report section for communications lines uses the asynchronous (ASYNC) protocol.

Note: A protocol data unit (PDU) for asynchronous communications is a variable-length unit of data that is ended by a protocol control character or by the size of the buffer.

Example

```
Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
   Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :   5/3.0   Stopped . . . : 10/02/03 16:00:00
Partition ID  : 003       Feature Code  . : 7427-2498-7427
PROTOCOL = ASYNC (SORT BY INTERVAL)
```

Itv End	IOP Name/ Line	Line Speed	Line Util	Bytes Transmitted Per Sec	Bytes Received Per Sec	Total PDUs Received	Pct PDUs Received in Error
	CMB11 (2805)						
14:00	FAXLINT14	115.2	.0	0	0	0	0
14:00	FAXLINT13	115.2	.0	0	0	0	0
14:00	FAXLINT12	115.2	.0	0	0	0	0
14:00	FAXLINT11	115.2	.0	0	0	0	0
14:01	FAXLINT14	115.2	.0	0	0	0	0
14:01	FAXLINT13	115.2	.0	0	0	0	0
14:01	FAXLINT12	115.2	.0	0	0	0	0
14:01	FAXLINT11	115.2	.0	0	0	0	0
14:02	FAXLINT14	115.2	.0	0	0	0	0
14:02	FAXLINT13	115.2	.0	0	0	0	0
14:02	FAXLINT12	115.2	.0	0	0	0	0
14:02	FAXLINT11	115.2	.0	0	0	0	0
14:03	FAXLINT14	115.2	.0	0	0	0	0
14:03	FAXLINT13	115.2	.0	0	0	0	0
14:03	FAXLINT12	115.2	.0	0	0	0	0
14:03	FAXLINT11	115.2	.0	0	0	0	0
14:04	FAXLINT14	115.2	.0	0	0	0	0
14:04	FAXLINT13	115.2	.0	0	0	0	0
14:04	FAXLINT12	115.2	.0	0	0	0	0
14:04	FAXLINT11	115.2	.0	0	0	0	0
14:05	FAXLINT14	115.2	.0	0	0	0	0
14:05	FAXLINT13	115.2	.0	0	0	0	0
14:05	FAXLINT12	115.2	.0	0	0	0	0
14:05	FAXLINT11	115.2	.0	0	0	0	0
14:06	FAXLINT14	115.2	.0	0	0	0	0

```
Itv End                 -- End time of the data collection interval or time vary off occurred
IOP Name/Line           -- IOP resource name and model number, Line ID
Line Speed              -- Line speed (1000 bits per second)
Line Util              -- Percent of available line capacity used in this interval
Bytes Trans /Sec       -- Average number of bytes transmitted per second
Total PDUs Received    -- Number of protocol data units received
Pct PDUs Received in   -- Percent of protocol data units received with errors
 Error
```

BSC Protocol

This sample of the report section for communications lines using the binary synchronous communications (BSC) protocol.

Example

```
                                        Resource Interval Report                        09/18/98 14:06:00
                                        Communications Line Detail                               Page  18
                                       Sample Resource Interval Report
 Member  . . . : PMISTGA1   Model/Serial  . : 500-2142/10-1803D
 Main storage . . : 128.0 M   Started . . . : 08/11/98 13:09:04
    Library . . : PM42CRT    System name . . :           ABSYSTEM
 Version/Release . :   4/2.0   Stopped . . . : 08/11/98 13:38:40
 PROTOCOL = BSC  (SORT BY INTERVAL)
                                                            Pct Data                               Pct Data
            IOP                   Bytes       Total Data    Characters   Bytes      Total Data      Characters
   Itv      Name/     Line  Line  Transmitted Characters   Transmitted  Received   Characters      Received    Line
   End      Line      Speed Util  Per Sec     Transmitted  in Error     Per Sec    Received         in Error    Errors
  -----   ---------- -------- ------ ------------- ------------- ------------- ---------- ------------ ------------ --------
            CC13
            (2609)
  13:14   PMBS1       19.2    .9          7          2,360          0          13         4,124          0          0
  13:14   PMBS2       19.2    .9         13          4,124          0           7         2,360          0          0
  13:19   PMBS1       19.2   1.1          9          2,990          0          17         5,226          0          0
  13:19   PMBS2       19.2   1.1         17          5,226          0           9         2,990          0          0
  13:24   PMBS1       19.2    .9          8          2,568          0          15         4,488          0          0
  13:24   PMBS2       19.2    .9         15          4,488          0           8         2,568          0          0
  13:29   PMBS1       19.2   1.1         10          3,103          0          18         5,423          0          0
  13:29   PMBS2       19.2   1.1         18          5,423          0          10         3,103          0          0
  13:34   PMBS1       19.2   1.2         11          3,424          0          19         5,984          0          0
  13:34   PMBS2       19.2   1.2         19          5,984          0          11         3,424          0          0
  13:38   PMBS1       19.2   1.0          9          2,463          0          15         4,302          0          0
  13:38   PMBS2       19.2   1.0         15          4,302          0           9         2,463          0          0
```

ISDN Network Interface

This sample of the report section uses the integrated services digital network (ISDN) network interface.

Example

```
                                        Resource Interval Report                        09/23/98 06:14:04
                                        Communications Line Detail                               Page  15
                                       Sample Resource Interval Report
 Member  . . . : ISDNDATA   Model/Serial  . : 500-2142/10-10DFD
 Main storage . . : 320.0 M   Started . . . : 08/14/98 13:30:23
    Library . . : ISDNDATA   System name . . :           ABSYSTEM
 Version/Release . :   4/2.0   Stopped . . . : 08/14/98 13:45:27
 PROTOCOL = ISDN NETWORK INTERFACE (SORT BY INTERVAL)
            IOP        --Outgoing---  ---Incoming---  LAPD      LAPD Pct  LAPD      LAPD Pct
            Name/      ---Calls-----  ----Calls-----  Total     Frames    Total     Frames    Loss of    Local
   Itv      Network    Line      Pct           Pct    Frames    Trnsmitd  Frames    Recd      Frame      End Code    Collision
   End      Interface  Speed Total Retry Total Reject Trnsmitd  Again     Recd      in Error  Alignment  Violation   Detect
  -----   ---------- ----- ------ ----- ------ ------ -------- -------- ------- -------- --------- --------- ---------
            CC05
            (2605)
  13:35   X31N00      16.3    0     0     0     0       60        0       60        0         0         0          0
  13:35   X31N01      16.3    0     0     0     0       60        0       60        0         0         0          0
  13:40   X31N00      16.3    0     0     0     0       60        0       60        0         0         0          0
  13:40   X31N01      16.3    0     0     0     0       60        0       60        0         0         0          0
  13:45   X31N00      16.3    0     0     0     0       60        0       60        0         0         0          0
  13:45   X31N01      16.3    0     0     0     0       60        0       60        0         0         0          0
 Itv End                -- End time of the data collection interval or time that vary
                           off occurred
 IOP Name/              -- IOP resource name and model number, Network interface description
  Network Interface
 Line Speed             -- Line speed (1000 bits per second)
 Outgoing Calls Total   -- Number of outgoing call attempts
 Outgoing Calls         -- Percent of outgoing calls that were rejected by the network
  Pct Retry
 Incoming Calls Total   -- Number of incoming call attempts
 Incoming Calls         -- Percent of incoming calls that were rejected
```

```
       Pct Reject
  LAPD Total Frames      -- Number of frames transmitted (applies to D-channel only)
   Trnsmitd
  LAPD Pct Frames        -- Percent frames re-transmitted due to error (applies to
   Trnsmitd Again           D-channel only)
  LAPD Total Frames      -- Number of frames received (applies to D-channel only)
   Recd
  LAPD Pct Frames        -- Percent frames received in error (applies to D-channel only)
   Recd in Error
  Loss of Frame          -- Number of times a time period equivalent to two 48 bit frames
   Alignment                elapsed without detecting valid pairs of line code violations
  Local End Code         -- Number of unintended code violations detected by the TE
   Violation                for frames received on the T interface
  Collision Detect       -- Number of times that a transmitted frame corrupted by
                            another frame was detected
```

Network Interface Maintenance Channel for ISDN

This sample of the report section uses the network interface maintenance channel for the ISDN protocol.

Example

```
                                 Resource Interval Report                      11/10/95 08:00:33
                                 Communications Line Detail                     Page  13
                                 User-Selected Report Title

  Member  . . . : MONDAY     Model/Serial  . : 200-2050/10-1500500
  Main storage  . . :  160.0 M Started . . . :  11/02/95 14:31:23
     Library . . : QPFRDATA    System name . . :          ABSYSTEM
  Version/Release . :   3/ 6.0 Stopped . . . :  11/02/95 16:26:12


  PROTOCOL = NWI MAINTENANCE CHANNEL (SORT BY INTERVAL)


          IOP                         Percent
          Name/           Percent    Severely   -----Detected Access-----  Far End
  Itv    Network    Line   Errored   Errored    ----Transmission Error---  Code
  End    Interface  Speed  Seconds   Seconds         In          Out       Violation
  -----  ---------- ------ -------   --------   ----------   ----------  ----------
          CC11
          (2623)

  14:46  ISDNSS_A     16.3    50        36           734          83          32
  15:01  ISDNSS_A     16.3     6        24            32          14          52
  15:16  ISDNSS_A     16.3     0         0             0           0           0
```

IDLC Protocol

These two samples of the report section for communications lines use the ISDN data link control (IDLC) protocol. The second report indicates which B-channel the IDLC line was using during the interval.

Example

```
                                 Resource Interval Report                      05/22/96 10:29:40
                                 Communications Line Detail                     Page  15
  Member  . . . : ECL       Model/Serial  . : 500-2142/10-10DFD
  Main storage  . . : 320.0 M   Started . . . : 04/15/96 10:35:30
     Library . . : PM37CT     System name . . :          ABSYSTEM
  Version/Release . :   3/7.0   Stopped . . . : 04/15/96 12:35:32
  PROTOCOL = IDLC (SORT BY INTERVAL)
          IOP                  Transmit/         ---Frames----        ---Frames----
          Name/                Receive/   Bytes  -Transmitted- Bytes  --Received---  Receive                    Short
  Itv    Network    Line  Line Average    Trnsmitd        Pct  Recd           Pct  CRC      Aborts  Sequence   Frame
  End    Interface  Descriptn Speed Line Util  Per Sec  Total  Err  Per Sec Total  Err  Errors   Recd    Error      Errors
  -----  ---------- ---------- ----- --------- -------- --------- --- ------- --------- --- ------- ------- -------- ------
          CC05
          (2605)
  11:43  ISDNA      IDLCA01    64.0  00/00/00       42        49   4      33       47   2       0       0        0       0
  11:43  ISDNB      IDLCB01    64.0  00/00/00        2         1   0       0        0   0       0       0        0       0
                                 Resource Interval Report                      05/22/96 10:29:40
                                 Communications Line Detail                     Page  17
  Member  . . . : ECL       Model/Serial  . : 500-2142/10-10DFD
  Main storage  . . : 320.0 M   Started . . . : 04/15/96 10:35:30
     Library . . : PM37CT     System name . . :          ABSYSTEM
  Version/Release . :   3/7.0   Stopped . . . : 04/15/96 12:35:32
  PROTOCOL = IDLC (SORT BY INTERVAL)
          IOP
          Name/
  Itv    Network    Line
  End    Interface  Description  Channel
  -----  ---------- ----------- -------
```

```
       CC05
      (2605)
11:43 ISDNA      IDLCA01     B1
11:43 ISDNB      IDLCB01     B1
```

Resource Interval Report - IOP Utilizations

The IOP Utilizations section of the Resource Interval Report contains a combination of input/output processor (IOP) utilizations

These utilizations are:

Disk IOP utilizations
> Gives input/output processor (IOP) utilization for direct access storage devices (DASDs). Consistent Disk IOP utilization at or above the threshold value affects system performance and causes longer response times and/or less throughput.

Multifunction IOP utilizations
> Gives input/output processor (IOP) utilization for DASD, communication, and local workstation devices. Consistent utilization at or above the threshold value affects system performance and causes longer response times and/or less throughput.

Communications IOP utilizations
> Gives communications input/output processor (IOP) utilization.

Local work station IOP utilizations
> Gives input/output processor (IOP) utilization for local workstation devices.

Example

Note: The total for the I/O processor utilization oftentimes does not match the sum of the three columns (IOP Processor Util Comm, IOP Processor Util LWSC, and IOP Processor Util DASD). This mismatch is caused by the utilization of other small components, such as system time.

```
                                      Resource nterval Report                         10/03/03 2:42:33
                                         IOP tilizations                              Page 27
                                   Perf data from 14:00 o 16:00 at 1 min
 Member  . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
   Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :  5/3.0   Stopped . . . : 10/02/03 16:00:00
 Partition ID : 003       Feature Code  . : 7427-2498-7427
IOP Name/        Itv  - IOP Processor Utils -    DASD Ops per sec    - KB per I/O -  KBytes Transmitted   Avail Local
(Model)          End Total Comm LWSC DASD   Reads      Writes     Read   Write    IOP    System     Storage (K) Util 2
---------------- ----- ----- ---- ---- ----- ---------- ---------- ------- ------- ----------- ----------- ---------- -----
CMB05     (2843) 14:00  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:05  .4   .0   .0   .0                                          3          0        63,513    .0
                 14:10  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:15  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:20  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:25  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:30  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:35  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:40  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:45  .4   .0   .0   .0                                          3          0        63,513    .0
                 14:50  .4   .0   .0   .0                                          2          0        63,513    .0
                 14:55  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:00  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:05  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:10  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:15  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:20  .4   .0   .0   .0                                          3          0        63,513    .0
                 15:25  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:30  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:35  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:40  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:45  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:50  .4   .0   .0   .0                                          2          0        63,513    .0
                 15:55  .5   .0   .0   .0                                          2          0        63,513    .0
                 16:00  .5   .0   .0   .0                                          3          0        63,513    .0
 IOP Name/                -- Input/Output processor resource name and
 (Model)                     model number of the attached device
 Itv End                  -- Interval end time (hour and minute)
 IOP Processor Util Total -- Total utilization for IOP
```

```
IOP Processor Util Comm  -- Utilization of IOP due to communications activity
IOP Processor Util LWSC  -- Utilization of IOP due to local workstation activity
IOP Processor Util DASD  -- Utilization of IOP due to DASD activity
DASD Ops per sec Reads   -- Number of reads per second
DASD Ops per sec Writes  -- Number of writes per second
K Per Read               -- Average number of kilobytes (1024) per read operation
K Per Write              -- Average number of kilobytes (1024) per write operation
IOP KBytes Transmitted   -- Number of Kbytes transmitted from the IOP to the system across the bus
System KBytes Transmitted-- Number of Kbytes transmitted from the system to the IOP cross the bus
Avail Local Storage (K)  -- Number of kilobytes (1024) of local storage that is free
Util 2                   -- Utilization of co-processor
```

Related reference

"Example: Resource Interval Report" on page 48
There are six sections to the Resource interval report.

Resource Interval Report - Local Work Station Response Times

The Local work station response times section of the Resource interval report provides the information for each data collection interval.

This information includes:

- Local work station IOP utilization
- Number of work stations active on each controller
- Range of response times for the work stations
- Average response time for the work stations

The values for the response time intervals may vary depending on the values that you use.

Example

```
                              Resource Interval Report                         10/03/03 12:42:33
                            Local Work Station Response Times                        Page 132
                              Perf data from 14:00 to 16:00 at 1 min
 Member   . . . : Q275140000 Model/Serial  . : 890/10-3907F
Main storage  . . : 56.4 GB   Started . . . : 10/02/03 14:00:00
   Library . . : PTLIBV5R3  System name . . : ABSYSTEM
Version/Release . :   5/3.0   Stopped . . . : 10/02/03 16:00:00
 Partition ID  : 003     Feature Code  . : 7427-2498-7427
IOP Name/        Work Station  Itv          Active                                                      Rsp
 (Model)         Controller    End    Util  Wrk Stn   0.0- .0    .0- .0    .0- .0    .0- .0    > .0    Time
----------------  ------------ -----  ----- ------- --------- --------- --------- --------- ------- ------
                                                     --------- --------- --------- --------- ------- ------
 Total Responses:
   0         0         0          0        0     .00
IOP Name/              -- Input/Output processor resource name and
 (Model)                  model number of the attached device
Work Station Controller -- Work station controller description name
Itv End                -- Interval end time (hour and minute)
Util                   -- Percentage of utilization for each IOP
Active Wrk Stn         -- Number of work stations with activity
 0.0- .0               -- Number of response times between  0.0 and   .0 seconds
  .0- .0               -- Number of response times between   .0 and   .0 seconds
  .0- .0               -- Number of response times between   .0 and   .0 seconds
  .0- .0               -- Number of response times between   .0 and   .0 seconds
  > .0                 -- Number of response times >   .0 seconds
Rsp Time               -- Average external response time (in seconds) for
                          work stations on this controller
```

Related reference

"Example: Resource Interval Report" on page 48
There are six sections to the Resource interval report.

Resource Interval Report - Remote Work Station Response Times

The Remote work station response times section of the Resource interval report provides information for each data collection interval.

This information includes:

- Number of work stations active on each controller

- Range of response times for the work stations
- Average response time for the work stations

The values for the response time intervals may vary depending on the values that you use.

Note: This section appears only if a 5494 remote controller is included in the data collection. Collection Services does not generate data for remote work stations (file QAPMRWS). This section applies only to performance data generated by the Start Performance Monitor (STRPFRMON) command prior to V5R1 and converted in V5R1 with the Convert Performance Data (CVTPFRDTA) command.

Example

```
                              Resource Interval Report                              09/24/98 07:40:58
                            Remote Work Station Response Times                                Page   9
                              Sample Resource Interval Report
 Member  . . . : TEST20     Model/Serial  . : 500-2142/10-317CD
Main storage  . . : 128.0 M   Started . . . : 09/19/98 16:47:34
   Library . . : RWSDATA     System name . . :           ABSYSTEM
Version/Release . :   4/2.0   Stopped . . . : 09/19/98 17:12:36
IOP Name/           Work Station  Itv         Active                                                 Rsp
 (Model)            Controller    End         Wrk Stn    0.0- 1.0   1.0- 2.0   2.0- 4.0   4.0- 8.0    > 8.0
Time
-----------------   ------------  -----       -------   ---------  ---------  ---------  ---------  -------  ------
CC02    (    )       ABSYSTEM    16:52          1          162         0          0          0         0    .02
                                 16:57          1          174         0          0          0         0    .02
                                 17:02          1          195         0          0          0         0    .03
                                 17:07          2          314         0          0          0         0    .02
                                                        ---------  ---------  ---------  ---------  ----------  ------
 Total Responses:
 845          0           0          0          0     .02
 IOP Name/             -- Input/Output processor resource name and
 (Model)                  model number of the attached device
 Work Station Controller -- Work station controller description name
 Itv End               -- Interval end time (hour and minute)
 Active Wrk Stn        -- Number of work stations with activity
  0.0- 1.0             -- Number of response times between  0.0 and  1.0 seconds
  1.0- 2.0             -- Number of response times between  1.0 and  2.0 seconds
  2.0- 4.0             -- Number of response times between  2.0 and  4.0 seconds
  4.0- 8.0             -- Number of response times between  4.0 and  8.0 seconds
   > 8.0               -- Number of response times >  8.0 seconds
 Rsp Time              -- Average external response time (in seconds) for
                          work stations on this controller
```

Related reference

There are six sections to the Resource interval report.

Performance Report columns

Each report includes columns of information. Look here for descriptions of that information.

>8.0 (Component) The number of times the response time was greater than 8 seconds.

%Write Cache Overruns
(Component) Percent of Write Cache Overruns during the collection interval.

---------- (pgmname)
(Transaction) The transaction totals record. For example, ---------- QUYLIST,. This report line occurs each time the job has an active-to-wait transaction. Totals are created for Rsp* (response time), *CPU Secs*, and I/O counts for the transaction.

A-I Wait /Tns
(Transaction) The average time, in seconds, of active-to-ineligible wait time per transaction. If this value is high, it may be because the time-slice value is set too low for many of the interactive jobs. Consider increasing the time slice-value.

Aborts Recd

(Resource Interval) The number of frames received that contained HDLC abort indicators. This indicates that the remote equipment ended frames before they were complete.

Act Jobs

(Job Interval) The number of selected jobs (interactive or noninteractive, depending on the report section) that were active during the interval.

Act Level

(Component) Initial pool activity level.

Act Lvl

(System, Pool Interval) Activity level. For the Pool Activity section of the Pool Interval Report, the activity level of the pool during the interval. For the Storage Pool Utilization section of the System Report, the activity level at the time of the first sample interval.

Act-Inel

(System, Component) Average number of active-to-ineligible job state transitions per minute.

Act-Wait

(System, Component) Number of transitions per minute from active state to wait state by processes assigned to this pool.

ACTIVE

(Job Trace) The time the job was processing.

Active Devices

(System) Average number of active devices on the line.

Active display stations (local or remote)

(System) The number of local or remote display stations entering transactions during the measurement period.

Active Jobs

(Transaction) The number of interactive jobs that were active during the interval.

Active Jobs Per Interval

(System) Average number of jobs of this type that were active per sample interval.

Active K/T /Tns

(Transaction) An average think time and keying time (or the delay time between the end of one transaction and the start of the next transaction), in seconds, for the active work stations (described under Est of AWS). Active K/T /TNS delay time differs from Key/Think /TNS delay time in that any delay time greater than 600 seconds has been rounded to 600 seconds. This technique is used to reduce the effect of very casual users (those who may do intermittent work or leave their work stations for long periods of time) on the estimate of active work stations.

Active Wrk Stn

(Resource Interval) The number of work stations with activity.

Active/Rsp

(Transaction) The time the job spends (either waiting or active) during transaction processing, while it holds an activity level.

Activity level

(System) The sum of activity levels for all interactive pools that had interactive job activity running in them.

Activity Level Time

(Transaction) A breakdown of the transaction time spent *ACTIVE*, waiting on a *SHORT WAIT*, and waiting on a *SEIZE/CFT* (seize conflict). The *SHORT WAIT* and *SEIZE CFT* time are included under *ACTIVITY LEVEL TIME*, because the activity-level slot is not given up during these times.

Note that the seize conflict time is included in the active time, not added to it to get transaction/response time, as is the case for waiting time.

Arith Ovrflw
(Component, Job Interval) The number of arithmetic overflow exceptions that occurred for the selected interactive jobs during the interval.

ASP ID
(System, Resource Interval) Auxiliary storage pool identifier.

ASP Rsc Name
(System, Resource) Identifies the ASP resource name to which the disk unit was allocated at collection time.

Async (System, Component, Transaction, Job Interval) The number of asynchronous disk I/O operations started by the selected interactive jobs during the interval. The job that starts the I/O operation may continue processing without having to wait for the I/O operation to complete. The I/O operation is completed by a background system test.

Async DIO /Tns
(Transaction) The sum of the averages of the asynchronous DB READ, DB WRITE, NDB READ, and NDB WRITE requests (the average number of asynchronous I/O requests per transaction for the job).

Async Disk I/O
(System, Component, Transaction) Number of asynchronous disk input/output operations per transaction.

Async Disk I/O per Second
(Component) Average asynchronous disk I/O operations per second.

Async Disk I/O Requests
(Transaction) The total number of asynchronous disk I/O requests for the given combination of priority, job type, and pool.

Async I/O /Sec
(Job Interval) The average number of asynchronous disk I/O operations started per second by the job during the interval. This is calculated by dividing the asynchronous disk I/O count by the elapsed time.

Async I/O Per Second
(Job Interval) The average number of asynchronous disk I/O operations started per second by the selected noninteractive jobs during the interval.

Async Max
(Transaction) Listed under Average DIO/Transaction, the maximum number of asynchronous DBR, NDBR, and WRT I/O requests encountered for any single transaction by that job. If the job is not an interactive or autostart job type, the total disk I/O for the job is listed here.

Async Sum
(Transaction) Listed under Average DIO/Transaction, the sum of the averages of the asynchronous DBR, NDBR, and WRT requests (the average number of asynchronous I/O requests per transaction for the job).

Asynchronous DBR
(System, Job Interval, Pool Interval) The average number of asynchronous database read operations on the disk per transaction for the job during the intervals. This is calculated by dividing the asynchronous database read count by the transactions processed. This field is not printed if the jobs in the system did not process any transactions. For the Resource Utilization section of the System Report, it is the number of asynchronous database read operations per second.

Note: The asynchronous I/O operations are performed by system asynchronous I/O tasks.

Asynchronous DBW

(System, Job Interval) The average number of asynchronous database write operations on the disk per transaction for the selected jobs during the interval. This is calculated by dividing the asynchronous database write count by the transactions processed. This field is not printed if the jobs in the system did not process any transactions. For the Resource Utilization section of the System Report, it is the number of asynchronous database read operations per second.

Note: The asynchronous I/O operations are performed by system asynchronous I/O tasks.

Asynchronous disk I/O per transaction

(System) The average number of asynchronous physical disk I/O operations per interactive transaction.

Asynchronous NDBR

(System, Job Interval, Pool Interval) The average number of asynchronous nondatabase read operations per transaction for the jobs in the system during the interval. This is calculated from the asynchronous nondatabase read count divided by the transactions processed. This field is not printed if the jobs in the system did not process any transactions. For the Resource Utilization section of the System Report, it is the asynchronous nondatabase read operations per second.

Note: The asynchronous I/O operations are performed by system asynchronous I/O tasks.

Asynchronous NDBW

(System, Job Interval, Pool Interval) The average number of asynchronous nondatabase write operations per transaction for the jobs in the system during the interval. This is calculated from the asynchronous nondatabase write count divided by the transactions processed. This field is not printed if the jobs in the system did not process any transactions. For the Resource Utilization section of the System Report, it is the number of asynchronous nondatabase write operations per second.

Note: The asynchronous I/O operations are performed by system asynchronous I/O tasks.

Avail Local Storage (K)

(Resource Interval) The number of kilobytes of free local storage in the IOP.

Available Storage

(Component) Available local storage (in bytes). The average number of bytes of available main storage in the IOP. The free local storage is probably not joined because it has broken into small pieces.

Average

(Transaction) The average value of the item described in the column for all transactions.

AVERAGE

(Job Trace) Averages for the fields. The entry on the AVERAGE line in the SEQUENCE column shows the number of STRTNS and ENDTNS pairs encountered. For an interactive job, this is the number of transactions entered while the trace was on if the default STRTNS and ENDTNS values were used.

Average Disk Activity Per Hour

(Component) See Disk Arm Seek Distance

Average DIO/Transaction

(Transaction) Seven columns of information about physical disk I/O counts. Physical I/O contrasts with logical I/O shown elsewhere in these reports. A logical I/O is a request sent at the program level that might result in an access to auxiliary storage (DASD). A physical I/O refers to those requests that actually result in access to auxiliary storage.

- Synchronous DBR

- Synchronous NDBR
- Synchronous Wrt
- Synchronous Sum
- Synchronous Max
- Async Sum
- Async Max

Average K per I/O

(Resource Interval) The average number of kilobytes transferred during each disk read or write operation.

Average Phys I/O /Sec

(Resource Interval) The average number of physical disk read and write operations per second made on all disks on the system.

Average Reads/Sec

(Resource Interval) The average number of physical disk read operations per second made on all disks on the system.

Average Response

(System) Average response time (in seconds) for interactive transactions. The Total/Average interactive response time does not include transactions for DDM server jobs.

Average Response Time

(System) Average disk response time per I/O operation.

Average Response Time (seconds)

(System) The average interactive response time.

Average Service Time

(System) Average disk service time per I/O operation. This is the amount of time a request would take if there were no contention.

Average Wait Time

(System) Average disk wait time per I/O operation. Normally due to contention.

Average Writes/Sec

(Resource Interval) The average number of physical disk write operations per second made on all disks on the system.

Avg CPU /Tns

(Transaction) The average number of processing unit seconds per transaction that fell in the given category.

Avg K/T /Tns

(Transaction) The average think time and keying time (or the delay time between transaction boundaries), in seconds, for the interactive jobs.

Avg Length

(Lock) The average number of milliseconds a lock or seize was held.

Avg Rsp (Sec)

(Transaction) The average transaction response time in seconds.

Avg Rsp /Tns

(Transaction) The average response per transaction (in seconds) for the transactions that fell into the given category.

Avg Rsp Time

(Component) Average transaction response time.

Avg Sec Locks

(Transaction) The average length of a lock in seconds attributed to interactive or noninteractive waiters.

Avg Sec Seizes

(Transaction) The average length of a seize in seconds attributed to interactive or noninteractive waiters.

Avg Time per Service

(Resource Interval) The amount of time a disk arm uses to process a given request.

Avg Util

(System, Resource Interval) On the Disk Utilization Summary of the Resource Report, the average percentage of available time that disks were busy. It is a composite average for all disks on the system. On the Communications Summary of the System Report, the average percentage of line capacity used during the measured time interval.

Batch asynchronous I/O per second

(System) The average number of asynchronous physical disk I/O operations per second of batch processing.

Batch CPU seconds per I/O

(System) The average number of system processing unit seconds used by all batch jobs for each I/O performed by a batch job.

Batch CPU Utilization

(Component) Percentage of available processing unit time used by the jobs that the system considers to be batch.

Note: For a multiple-processor system, this is the average use across all processors.

Batch impact factor

(System) Batch workload adjustment for modeling purposes.

Batch permanent writes per second

(System) The average number of permanent write operations per second of batch processing.

Batch synchronous I/O per second

(System) The average number of synchronous physical disk I/O operations per second of batch processing.

BCPU / Synchronous DIO

(Transaction) The average number of batch processor unit seconds per synchronous disk I/O operation.

Bin (Transaction) The number of binary overflow exceptions.

Binary Overflow

(Component) Number of binary overflows per second.

BMPL - Cur and Inl

(Transaction) The number of jobs currently in the activity level (beginning current multiprogramming level), and the number of jobs on the ineligible queue (beginning ineligible multiprogramming level) for the storage pool that the job ran in when the job left the wait state (the beginning of the transaction).

Note: Multiprogramming level (MPL) is used interchangeably with activity level.

Bundle Wait Count

(Component) Total number of times the tasks and jobs waited for journal bundles to be written to disk.

Bundle Wait Pct

(Component) Percentage of time (relative to the interval elapsed time) spent waiting for journal bundles to be written to disk.

Bundle Writes System

(Component) Number of bundle writes to internal system journals. A bundle write is a group of journal entries which are deposited together by the system.

Bundle Writes User

(Component) Number of bundle writes to user-created journals. A bundle write is a group of journal entries which are deposited together by the system.

Bytes per Second Received

(System) Average number of bytes received per second.

Bytes per Second Transmitted

(System) Average number of bytes transmitted per second.

Bytes Recd per Sec

(Resource Interval) The average number of bytes received per second.

Bytes Trnsmitd per Sec

(Resource Interval) The average number of bytes transmitted per second.

Category

(Transaction) A group of transactions categorized together. In the Analysis by Interactive Transaction Category, the transactions are categorized by the processing unit model. The boundary values that are used to separate the transactions are given in the *Avg CPU /Tns* column. For the Analysis by Interactive Response Time, they are categorized by their response time. For the Analysis by Interactive Key/Think Time, they are categorized by their key/think time.

Cache Hit Statistics

(Component) Statistics data about use of cache including:

- The percent of Device Cache Read Hit for each arm.
- The percent of Controller Cache Read Hit for each arm.
- The percent of efficiency of write cache

Device read

Device Read is the number of Device Cache Read Hits (DSDCRH) divided by number of Device Read Operations (DSDROP), expressed as a percent

Controller read

Controller Read is the number Controller Cache Read Hits (DSCCRH) divided by number of Read Commands (DSRDS), expressed as a percent.

Write efficiency

Write efficiency is the difference between Write Commands (DSWRTS) and Device Write Operations (DSDWOP) divided by Write Commands (DSWRTS), expressed as a percent.

EACS Read

The percent of read hits by the Extended Adaptive Cache Simulator.

EACS Resp

The percent of response time improvement by the Extended Adaptive Cache Simulator.

Channel

(Resource Interval) The B-channel used by the IDLC line. (special condition)

Cmn (Job Interval) The number of communications I/O operations performed by the selected interactive jobs during the interval.

Cmn I/O

(Component) Number of communications operations (Get, Put).

Cmn I/O Per Second

(Job Interval) The average number of communications I/O operations performed per second by the selected noninteractive jobs during the interval.

Collision Detect

(Resource Interval) The number of times that the terminal equipment (TE) detected that its transmitted frame had been corrupted by another TE attempting to use the same bus.

Commit Ops

(Component) Commit operations performed. Includes application and system-provided referential integrity commits.

Communications I/O Count

(System) Number of communications I/O operations.

Communications I/O Get

(System) Number of communication get operations per transaction.

Communications I/O Put

(System) Number of communication put operations per transaction.

Communications Lines

(System, Component, Job Interval, Pool Interval) For the Report Selection Criteria, the list of communications lines selected to be included (SLTLINE parameter) or excluded (OMTLINE parameter). These are the communications line names you specify.

Control Units

(System, Component, Job Interval, Pool Interval) The list of control units selected to be included (SLTCTL parameter) or excluded (OMTCTL parameter). These are the controller names you specify.

Count   (Transaction, Lock) The number of occurrences of the item in the column. For example, in a lock report, it is the number of locks or seizes that occurred.

CPU   (Transaction) The total processing unit seconds used by the jobs with a given priority.

CPU   (Job Trace) The approximation of the CPU used on this trace entry. This is a calculated value based on the time used and the CPU model being run.

CPU /Tns

(Transaction, Job Interval) The amount of available processing unit time per transaction in seconds.

CPU Model

(System) The processing unit model number.

CPU per I/O Async

(System) CPU use per asynchronous I/O.

CPU per I/O Sync

(System) CPU use per synchronous I/O.

CPU per Logical I/O

(System) Processing unit time used for each logical disk I/O operation.

CPU QM

(Transaction) The simple processing unit queuing multiplier.

CPU Sec

(Transaction) The processing unit time used by the job in this state.

CPU Sec /Sync DIO

(Transaction) The ratio of CPU seconds divided by synchronous disk I/O requests for each type of job.

CPU Sec Avg and Max
(Transaction) The average processing unit time per transaction for the job and the largest processing unit time used for a transaction in the job. If the job is not an interactive or autostart job type, then only the total processing unit time for the job is listed under the MAX column heading.

CPU Sec per Tns
(Transaction) The processing unit time per transaction.

CPU Seconds
(System, Transaction, Component) Average processing unit seconds used per transaction. For System Summary Data, it is the total available processing unit time used by the jobs during the trace period. For Priority-Jobtype-Pool Statistics, it is the total processing unit seconds used by the jobs with a given combination of priority, job type, and pool. For Batch Job Analysis, it is the amount of available processor unit time used by the job in seconds. For Concurrent Batch Job Statistics, it is the amount of available processor unit time used by the jobs in the job set in seconds.

CPU SECONDS
(Job Trace) The approximate processing unit time used for the transaction.

CPU seconds per transaction
(System) The average processing unit seconds per transaction.

CPU Util
(System, Component, Transaction, Job Interval, Pool Interval, Batch Job Trace) Percentage of available processing unit time used. For multiple-processor systems, this is the total utilization divided by the number of processors.

CPU Util per Transaction
(Component) The result of the CPU Utilization divided by the total number of transactions for the job.

CPU Utilization (Batch)
The percentage of available CPU time that is used by batch jobs. This is the average of all processors.

CPU Utilization (Interactive)
The percentage of available CPU time that is used by interactive jobs. This is the average of all processors.

CPU Utilization (Total)
The percentage of available CPU time that is used by interactive and batch jobs. This is the average of all processors.

> **Note:** For uncapped partitions, the Total CPU utilization might exceed 100 percent.

CPU/Async I/O
(Job Interval) The average number of milliseconds of processing unit time taken for each asynchronous disk I/O operation. This is calculated by dividing the milliseconds of the processing unit time the job used by the asynchronous disk I/O count.

CPU/Sync I/O
(Job Interval) The average number of milliseconds of processing unit time taken for each synchronous disk I/O operation. This is calculated from the milliseconds of the processing unit time used by the job divided by the synchronous disk I/O count.

CPU/Tns
(Transaction) The average number of processing seconds per transaction for the job during the interval. This is calculated from the amount of processing unit time used divided by the number of transactions processed.

Cpu/Tns (Sec)

(Transaction) The number of processing unit seconds per transaction.

Ctl   (Component) Controller identifier.

Cum CPU Util

(Transaction) The cumulative percentage of available processing unit time used by the transactions that have an average response time per transaction equal to or less than the given category. For example, in CPU by Priority for All Jobs for Total Trace Period (System Summary Data), it is the unit time used by the jobs with a priority higher or equal to the given priority.

Cum Pct Tns

(Transaction) Cumulative CPU percent per transaction. For system summary data, it is the cumulative CPU percentage of all transactions that have an average response time per transaction equal to or less than the given category. For Interactive Program Transactions Statistics, it is the cumulative CPU percentage of all transactions through the listed program. For Job Statistics section, it is the cumulative CPU percentage of total transactions through the listed job. For Interactive Program Statistics section, it is the cumulative CPU percentage of all transactions through the listed program.

Cum Util

(System) Cumulative CPU use (a running total).

> **Note:** This is taken from the individual jobs and may differ slightly from the total processing unit use on the workload page.

Cur Inl MPL

(Transaction) The number of jobs waiting for an activity level (ineligible) in the storage pool.

Cur MPL

(Transaction) The number of jobs holding an activity level in the storage pool.

Current User

(Job) The user under which the job was running at the end of each interval.

DASD Ops/Sec

(Component) Disk operations per second.

DASD Ops Per Sec Reads

(Resource) Number of reads per second

DASD Ops Per Sec Writes

(Resource) Number of writes per second

Datagrams Received

(Component) The total number of input datagrams received from interfaces. This number includes those that were received in error.

DB   (Job Trace) The number of physical database reads that occurred for the entry.

DB Cpb Util

(Component) The percentage of database capability that is used to perform database processing.

DB Fault

(System, Component) Average number of database faults per second.

DB Pages

(System, Component) Average number of database pages read per second.

DB Read

(Transaction) When listed in Physical I/O Counts column, it is the number of database read requests while the job was in that state. When listed in the Sync Disk I/O Rqs/Tns column, it is the average number of synchronous database read requests per transaction.

DB READS
(Job Trace) The number of physical database reads that occurred.

DB Write
(Transaction) When listed in the Sync Disk I/O Rqs/Tns column, it is the average number of synchronous database write requests per transaction.

DB Wrt
(Transaction) When listed in the Physical I/O Counts column, it is the number of database write requests while the job was in that state. When listed in the Synchronous Disk I/O Counts column, it is the number of synchronous database write requests per transaction.

DDM I/O
(Component, Job Interval) The number of logical database I/O operations for a distributed data management (DDM) server job.

DDM Svr Wait /Tns
(Transaction) The average time, in seconds, that a source distributed data management (DDM) server job spent waiting for the target system to respond to a request for data per transaction. This value includes line time and time spent by the target system responding to the request for data.

Dec (Transaction) The number of decimal overflow exceptions.

Decimal Data
(Component) Data exception count per second. A data exception occurs when data that is not valid is detected by arithmetic instructions. Examples are signs or digit codes that are not valid in decimal instructions, or an insufficient number of farthest left zeros in multiply instructions.

Decommit Ops
(Component) Decommit operations performed. Includes application and system-provided referential integrity decommits.

Decimal Overflow
(Component) Number of decimal overflows per second.

Description
(Component) More detailed description of the exception type.

Detected Access Transmission Error (DTSE) In
(Resource Interval) The number of times the network termination 1 (NT1) end point notified the terminal equipment (TE) of an error in data crossing the ISDN U interface from the line transmission termination (LT) to the NT1 end point. The NT1 end point reports the errors to the TE through the maintenance channel S1.

Detected Access Transmission Error (DTSE) Out
(Resource Interval) The number of times the network termination 1 (NT1) end point notified the terminal equipment (TE) of an error in data crossing the ISDN U interface from the NT1 end point to the LT. The NT1 end point reports the errors to the TE through the maintenance channel S1.

Device
(Component) Device identifier.

DIO/Sec Async
(System) Number of asynchronous I/O operations per second.

DIO/Sec Sync
(System) Number of synchronous I/O operations per second.

Disk Arm Seek Distance
(Component) Average seek distance distributions per hour:

0 Number of zero seeks

> **1/12** Number of seeks between 0 and 1/12 of the disk
>
> **1/6** Number of seeks between 1/12 and 1/6 of the disk
>
> **1/3** Number of seeks between 1/6 and 1/3 of the disk
>
> **2/3** Number of seeks between 1/3 and 2/3 of the disk
>
> **>2/3** Number of seeks greater than 2/3 of the disk

Disk Arms
(System) The number of disk arms for this IOP.

Disk Capacity
(Component) Average amount of disk space used or available.

> **MB** Millions of bytes available on the disk.
>
> **Percent**
> Percent of space available on the disk.

Disk Controllers
(System) The number of disk storage controllers for this IOP.

Disk Feature
(System) The type of disk (9332, 9335, and so on).

Disk I/O Async
(System, Component) Total number of asynchronous disk I/O operations.

Disk I/O Logical
(Component) The number of logical disk operations, such as gets and puts.

Disk I/O per Second
(System) Average number of physical disk I/O operations per second.

Disk I/O Reads /Sec
(Resource Interval) The average number of disk read operations per second by the disk IOP.

Disk I/O Requests
(Transaction) The total number of synchronous and asynchronous disk I/O requests issued by the jobs during the trace period.

Disk I/O Sync
(System, Component) Total number of synchronous disk I/O operations.

Disk I/O Writes /Sec
(Resource Interval) The average number of disk write operations per second by the disk IOP.

Disk IOPs
(System) The number of disk IOP controllers.

Disk mirroring
(System) Indicates whether disk mirroring is active.

Disk Space Used
(Resource Interval) The total disk space used in gigabytes for the entire system.

Disk transfer size (KB)
(System) The average number of kilobytes transferred per disk operation.

Disk utilization
(System) The fraction of the time interval that the disk arms were performing I/O operations.

Dsk CPU Util
(System, Resource Interval) The percentage of CPU used by the disk unit.

Dtgm Req Transm Dscrd

(Component) The percentage of IP datagrams that are discarded because of the following reasons:

- No route was found to transmit the datagrams to their destination.
- Lack of buffer space.

Dtgm Req for Transm Tot

(Component) The total number of IP datagrams that local IP user-protocols supplied to IP in requests for transmission.

Elapsed Seconds

(Transaction, Component) The elapsed time in seconds. For the Batch Job Analysis section of the Transaction Report, it is the number of seconds elapsed from when the job started to when the job ended. For the Concurrent Batch Job Statistics section of the Transaction Report, it is the total elapsed time of all jobs in that job set.

Elapsed Time

(Job Interval) The amount of time (minutes and seconds) for which the job existed during the interval. This is the same as the interval length unless the job started or ended during the interval, in which case it is less.

Elapsed Time--Seconds

(Transaction) Shows the time spent by the job, in the following columns:

Long Wait

Elapsed times in the state (such as waiting for the next transaction or lock-wait time).

Active/Rsp

During transaction processing, the time the job spends (either waiting or active) while it holds an activity level. At the end of a transaction (on the transaction totals line), this is the time the job spent processing the transaction in an activity level, for long waits caused by locks, and in the ineligible state.

Inel Wait

The time the job spent in the ineligible wait state waiting for an activity level.

EM3270 Wait /Tns

(Transaction) The average, in seconds, of the time spent waiting on the host system communications for Systems Network Architecture (SNA) and binary synchronous communications (BSC) 3270DE per transaction. Program logic is required to determine if the emulation program is communicating with the display or the host processing unit. Because there are requirements on event-wait processing, not all transition combinations can be detected.

ENTRY

(Job Trace) The instruction in the program where the program was given control. This is true when a program is nonobservant and observant.

EORn (Transaction) Listed in the Wait Code column, End of response time for transaction n. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

EOTn (Transaction) Listed in the Wait Code column, End of transaction for transaction for type n. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

Estimated Exposr AP Not Jrnld

(Component) System-estimated access path recovery time exposure in minutes if no access paths were being journaled by the system.

Estimated Exposr Curr System

(Component) System-estimated access path recovery time exposure in minutes.

Est Of AWS

(Transaction) An estimate of the number of active work stations for the trace period or interval. Any delay time greater than 600 seconds has been rounded to 600 seconds. This technique is used to reduce the effect of very casual users (those who may do intermittent work or leave their work stations for long periods of time) on the estimate of active work stations.

Event Wait /Tns

(Transaction) The average time, in seconds, of the event-wait time per transaction. Often requests made by a job that runs on the system are made to asynchronous jobs. These asynchronous jobs use an event to signal completion of the request back to the requester. The event-wait time is the time the requesting job waits for such a signal.

EVT (Transaction) Listed in the Wait Code column, Event Wait. This is a long wait that occurs when waiting on a message queue.

Exception Type

(Component) Type of program exception that results from the internal microprogram instructions being run in internal microprogram instructions procedure. Because these exceptions are monitored at a low level within the system, it is difficult to associate these exceptions with specific end-user operations. The counts are meaningful when the processing unit time required to process them affects system performance. A variation in the counts may indicate a system change that could affect performance. For example, a large variation in seize or lock counts may indicate a job scheduling problem or indicate that contention exists between an old application and a new one that uses the same resources.

> **Note:** To see the seize and lock counts, you should collect the trace data by using the Start Performance Trace (STRPFRTRC) command. Run the Print Transaction Report (PRTTNSRPT) to list the objects and jobs that are holding the locks.

Exceptional wait

(System) The average exceptional wait time, in seconds, per transaction. An *exceptional wait* is that portion of internal response time that cannot be attributed to the use of the processor and disk. An exceptional wait is caused by contention for internal resources of the system, for example, waiting for a lock on a database record.

> **Constant**
>> The portion of exceptional wait time held constant as throughput increases.

> **Variable**
>> The portion of exceptional wait time that varies as throughput increases.

Excp (Component, Transaction) For the Component Report, it is the total number of program exceptions that occurred per second. For the Transaction Report, a Y in this column means that the transaction had exceptions. The types of exceptions that are included are process access group exceptions, and decimal, binary, and floating point overflow. See the Transition Report to see which exceptions the transaction had.

Excp Wait

(Transaction) The amount of exceptional wait time for the jobs in the job set in seconds.

Excp Wait /Tns

(Transaction) The average exceptional wait time, in seconds, per transaction. This value is the sum of those waits listed under the Exceptional Wait Breakdown by Job Type part.

Excp Wait Sec

(Transaction) The total amount of exceptional wait time in seconds for the job.

Excs ACTM /Tns

(Transaction) The average time, in seconds, of the excess activity level time per transaction (for example, time spent in the active state but not using the processing unit). If enough activity levels are available and there is plenty of interactive work of higher priority to do, a job waits longer

for processing unit cycles. If the value is greater than .3, look at jobs that correspond to particular applications for more information. By looking at these jobs, you might be able to determine which application's jobs are contributing most to this value. Use the Transaction and Transition Reports for these jobs for additional information. The formula for excessive activity-level time is shown below:

```
Active Time - [
(multiplier X CPU X Beginning Activity Level) +
(Number of synchronous disk I/O operations X .010)]
```

> **Note:** If the beginning activity level is greater than 1, the multiplier equals 0.5. If the beginning activity level is any other value, the multiplier equals 1.

EXIT (Job Trace) The instruction number in the program where the program gave up control.

Expert Cache
(System, Component) Directs the system to determine which objects or portions of objects should remain in a shared main storage pool based on the reference patterns of data within the object. Expert cache uses a storage management tuner, which runs independently of the system dynamic tuner, to examine overall paging characteristics and history of the pool. Some values that you might see in this column are associated with the Work with Shared Pools (WRKSHRPOOL) command:

- 0=*FIXED, which indicates the system does not dynamically adjust the paging characteristics of the storage pool. The system uses default values.
- 3=*CALC, which indicates the system dynamically adjusts the paging characteristics of the storage pool for optimum performance.

Exposed AP System Journaled
(Component) The number of exposed access paths currently being journaled by the system.

Exposed AP System Not Journaled
(Component) The number of exposed access paths currently not being journaled by the system.

/F (System, Resource Interval) The line speed of the protocol reported as full duplex. This indicator applies to the line speeds for an Ethernet (ELAN) token-ring (TRLAN) line, or an asynchronous transfer mode line.

Far End Code Violation
(Resource Interval) The number of unintended code violations detected by the network termination 1 (NT1) end point for frames transmitted to the NT1 end point on the interface for the T reference point. The NT1 end point reports a violation to the termination equipment (TE) through the maintenance channel S1.

Faults (System) A value that represents the total page faults that occurred for each job type or job priority during the collection. This is the same value as shown in the JBTFLT field of the QAPMJOBS or QAPMJOBL file.

File (Transaction) The file that contains the object.

Flp (Transaction) The number of floating point overflow exceptions.

Flp Overflow
(Component) Number of floating point overflows per second.

Frame Retry
(Resource Interval) The number of attempts to retransmit a frame to a remote controller.

Frames Received Pct Err
(Resource Interval) The percentage of frames received in error. Errors can occur when the host system has an error or cannot process received data fast enough.

Frames Received Total

(Resource Interval) The total number of frames received including frames with errors and frames that are not valid.

Frames Transmitted Pct Err

(Resource Interval) The percentage of frames retransmitted due to error.

Frames Transmitted Total

(Resource Interval) The total number of frames transmitted.

FULL CLS

(Job Trace) The number of full closes for all types of files.

FULL OPN

(Job Trace) The number of full opens for all types of files.

FUNCTION

(Job Trace) This causes the trace entry to be recorded. The possible trace entries are as follows:

Table 1.

Function ID	Description
DATA	Data trace record
CALL	Call external
XCTL	Transfer control
EVENT	Event handler invocation
EXTXHINV	External exception handler invocation
INTXHINV	Internal exception handler invocation
INTXHRET	Return from internal exception handler
INVEXIT	Invocation exit
RETURN	Return external
ITRMXRSG	Invocation ended due to resignaling exception
EXTXHRET	Return external or from a procedure instruction
PTRMTPP	Termination phase end
PTRMUNX	End process due to an unhandled exception
NOTUSED	This type is a non-valid trace type
ITERM	Invocation ended
CANCLINV	Cancel invocation instruction

Functional Areas

(System, Component, Transaction, Job Interval, Pool Interval) For Report Selection Criteria, the list of functional areas selected to be included (SLTFCNARA parameter) or excluded (OMTFCNARA parameter).

/H   (System, Resource Interval) The line speed of the protocol reported as half duplex. This indicator applies to the line speeds for an Ethernet (ELAN) token-ring (TRLAN) line, or an asynchronous transfer mode line.

HDW   (Transaction) Listed in the Wait Code column, Hold Wait (job suspended or system request). The job released a lock it had on the object named on the next detail line of the report (OBJECT --). The job that was waiting for the object is named on this line (WAITER --) along with the amount of time the job spent waiting for the lock to be released.

High Srv Time

(Resource Interval) The highest average service time in seconds for a disk arm in the system.

High Srv Unit
> The disk arm with the highest service time.

High Util
> (Resource Interval) The percentage of use for the disk arm that has the highest utilization.

High Util Unit
> (Component, Resource Interval) The disk arm with the highest utilization.

High Utilization Disk
> (Component) Percent of utilization of the most utilized disk arm during this interval.

High Utilization Unit
> (Component) Disk arm that had the most utilization during this interval.

Holder Job Name
> (Transaction) The name of the job that held the object.

Holder Number
> (Transaction) The number of the job that held the object.

Holder Pool
> (Transaction) The pool that held the job while it was running.

Holder Pty
> (Transaction) The priority of the holder's job.

Holder Type
> (Transaction) The type and subtype of the holder's job.

Holder User Name
> (Transaction) The name of the user that held the object.

Holder's Job Name
> (Lock) The name of the job holding the lock.

I Frames Recd per Sec
> (Resource Interval) The number of information frames received per second.

I Frames Trnsmitd per Sec
> (Resource Interval) The number of information frames transmitted per second.

I/O Wait
> (Resource Interval) The amount of time in which a given I/O request is ready to be processed, but the disk arm is not yet available to perform the request.

ICMP Messages Error
> (Component) This is the number of Internet Control Message Protocol (ICMP) messages that the entity received but determined that the messages had errors or are messages that the entity did not send due to problems.

ICMP Messages Received
> (Component) This is the total number of Internet Control Message Protocol (ICMP) messages that the entity received.

ICMP Messages Sent
> (Component) This is the total number of Internet Control Message Protocol (ICMP) messages that the entity attempted to send.

Incoming Calls Pct Retry
> (Resource Interval) The percentage of incoming calls that were rejected by the network.

Incoming Calls Total
> (Resource Interval) The total number of incoming call attempts.

Inel Time A-I/W-I

(Transaction) The amount of time the job spent in the ineligible state, either coming from time slice end (active-to-ineligible) or from the wait state (wait-to-ineligible).

Inel Wait

(Transaction) Listed in the Elapsed Time--Seconds column, the time the job spent in the ineligible wait state waiting for an activity level.

Int Feat Util

(Component) The percentage of Interactive Feature that is used by all jobs.

Inter CPU Utilization

(Component) Percentage of available processing unit time used by the jobs that the system considers to be interactive.

Note: For a multiple-processor system, this is the average use across all processors.

INV (Job Trace) The call level of the program.

IOP (Component) Input/output processor (IOP) Resource name and model number for each communications IOP, DASD IOP, local workstation IOP, and multifunction IOP. Communications IOP is the percent of CPU used in the IOP. The percent does not necessarily mean that the IOP is doing any data transfers. Some of the percent can be attributed to overhead of an active line.

IOP Name/Line

(System, Resource Interval) Input/output (IOP) processor resource name and model number line.

IOP Name(Model)

(Resource Interval) The input/output processor (IOP) identification and the model number in parentheses.

IOP Name

(System, Component) Input/Output processor (IOP) resource name.

IOP Name Network Interface

(Resource Interval) The IOP name of the network interface.

IOP Processor Util Comm

(Component, Resource) Utilization of IOP due to communications activity.

IOP Processor Util LWSC

(Component, Resource) Utilization of IOP due to local workstation activity.

IOP Processor Util DASD

(Component, Resource) Utilization of IOP due to DASD activity.

IOP Processor Util Total

(Component, Resource Interval) The total percent of utilization for each local workstation, disk, and communications IOP.

IOP Util

(System) For the Disk Utilization section of the System Report, it is the percentage of utilization for each input/output processor (IOP).

Note: For the multifunction I/O processors, this is utilization due to disk activity only, not communications activity. For the System Model Parameter section it is the fraction of the time interval the disk IOP was performing I/O operations.

Itv End

(Component, Transaction, Job Interval, Pool Interval, Resource Interval) The time (hour and minute) when the data was collected. For the Exception Occurrence Summary and Interval Counts of the Component Report, it is the ending time for the sample interval in which Collection Services recorded the exception.

Job Maximum A-I

(Pool Interval) The highest number of active-state to ineligible-state transitions by a selected job in the pool or subsystem.

Job Maximum A-W

(Pool) The highest number of active-to-wait state transitions by a selected job in the pool or subsystem.

Job Maximum CPU Util

(Pool Interval) The highest percentage of available processing unit time used by a selected job in the pool or subsystem.

Job Maximum Phy I/O

(Pool Interval) The highest number of physical disk input and output operations by a selected job in the pool or subsystem.

Job Maximum Rsp

(Pool Interval) The highest response time in seconds per transaction by a selected job in the pool or subsystem. The response time is the amount of time spent waiting for and using the resources divided by the number of transactions.

Job Maximum Tns

(Pool Interval) The highest number of transactions by a selected job in the pool or subsystem.

Job Maximum W-I

(Pool Interval) The highest number of wait-state to ineligible-state transitions by a selected job in the pool or subsystem.

Job Name

(Component, Transaction, Job Interval, Batch Job Trace) Name of the job. In the Job Summary Report of the Transaction Report, a job (identical job name, user name, and job number) appears multiple times in this list if the job uses the system Reroute Job (RRTJOB) command.

Job Number

(Component, Transaction, Job Interval, Batch Job Trace) The number of the job which the summary line describes. In the Transaction Report, an asterisk (*) before the job number indicates the job signed on during the measurement period. An asterisk (*) after the job number indicates the job signed off during the measurement period.

Job Pty

(Batch Job Trace) Priority of the job.

Job Set

(Transaction) The number of job sets is the number of batch jobs that could be active at any time during the trace period. If two jobs run sequentially, they show up as two jobs in the same job set. If two jobs run concurrently, they show up in two different job sets.

Job Type

(All Reports except where noted for the Transaction Report) Job type and subtype. Possible job type values include the following:

A   Autostart

B   Batch

BD   Batch immediate (Transaction only)

> **Note:** The batch immediate values are shown as BCI on the Work with Active Job display and as BATCHI on the Work with Subsystem Job display.

BE   Batch evoke (Transaction only)

BJ   Batch pre-start job (Transaction only)

C Programmable workstation application server, which includes 5250 emulation over APPC and iSeries Access host servers running either APPC or TCP/IP. A job is reported as a iSeries Access server if any of the following items are true:

- Incoming APPC evoke requests one of the server program names. This also applies to the pre-started jobs for the QSERVER, QCMN, and QSYSWRK subsystems that are already waiting for the named program.
- Incoming IP port number corresponds to one of the service name-description-port-numbers. This also applies to the pre-started jobs for the QSERVER, QCMN, and QSYSWRK subsystems that are already waiting for the assigned IP port number.
- Incoming IPX socket number corresponds to one of the service name-description-port-numbers. This also applies to the pre-started jobs for the QSERVER, QCMN, and QSYSWRK subsystems that are already waiting for the assigned IPX port number.
- Incoming 5250 display emulation jobs that come from APPC data streams sent by 5250 emulation under OS/2® Communications Manager or WARP equivalent.

D Target distributed data management (DDM) server

I Interactive. Interactive includes twinaxial data link control (TDLC), 5250 remote workstation, and 3270 remote workstation. For the Transaction Report, this includes twinaxial data link control (TDLC), 5250 remote workstation, 3270 remote workstation, SNA pass-through, and 5250 Telnet.

L Licensed Internal Code task

M Subsystem monitor

P SNA pass-through and 5250 Telnet pass-through. On the Transaction Report, these jobs appear as I (interactive).

R Spool reader

S System

W Spool writer, which includes the spool write job, and if Advanced Function Printing™ (AFP™) is specified, the print driver job.

WP Spool print driver (Transaction only)

X Start system job

Possible job subtype values include the following:

D Batch immediate job

E Evoke (communications batch)

J Pre-start job

P Print driver job

T Multiple requester terminal (MRT) (System/36™ environment only)

3 System/36

Noninteractive job types include:
- Autostart
- Batch
- Evoke
- iSeries Access-Bch
- Server
- Spool
- Distributed data management (DDM) server

Special interactive job categories include:

- Interactive
- Multiple requester terminal (MRT)
- Pass-through
- System/36

Jobs   (System, Component, Transaction, Pool Interval, Job Interval) The jobs you specify. The format of the entries is `jobnumber/username/jobname`. For the Report Selection Criteria report, it is the list of jobs selected to be included (SLTJOB parameter) or excluded (OMTJOB parameter). This does not include jobs selected by using the STLFCNARA or OMTFCNARA parameter.

K per I/O

(System, Resource Interval) The average number of kilobytes (1024 bytes) read or written for each disk I/O operation.

K/T /Tns Sec

(Transaction) The average delay time, or time spent keying and thinking between transactions for the job, in seconds. The value represents the time interval between active-to-wait and wait-to-active or wait-to-ineligible job state transitions.

KB per I/O Read

(Resource Interval) The average number of kilobytes (1 KB equals 1024 bytes) transferred per read operation.

KB per I/O Write

(Resource Interval) The average number of kilobytes (1024 bytes) transferred per write operation.

KB Received/Second

(System, Component) The total number of kilobytes (1024) received per second on the specified interface when it was active on the selected intervals, which includes framing characters.

KB Transmitted/Second

(System, Component) The total number of kilobytes (1024) transmitted per second from the specified interface when it was active on the selected intervals, which includes framing characters.

KBytes Transmitted IOP

(Component, Resource Interval) Total kilobytes transmitted from an IOP to the system across the bus.

KBytes Transmitted System

(Component, Resource Interval) Total kilobytes transmitted to the IOP from the system across the bus.

Key/Think

(Transaction) The amount of time spent waiting for the work station user by the program.

Key/Think /Tns

(Transaction) The average think time and keying time (or the delay time between transaction boundaries), in seconds, for the interactive jobs.

L   (Lock) Whether this is a lock or seize conflict. The column contains an L if lock, blank if seize.

LAPD Pct Frames Recd in Error

(Resource Interval) The percentage of frames received in error (applies to D-channel only). Errors can occur when the host system has an error or cannot process received data fast enough.

LAPD Pct Frames Trnsmitd Again

(Resource Interval) The percentage of frames retransmitted due to error (applies to D-channel only).

LAPD Total Frames Recd
(Resource Interval) The total number of frames received including frames with errors and frames that are not valid (applies to D-channel only).

LAPD Total Frames Trnsmitd
(Resource Interval) The total number of frames transmitted (applies to D-channel only).

Last 4 Programs in Invocation Stack
(Transaction) The last four programs in the program stack. For example, at the start of a transaction (such as when the work station operator presses the Enter key), you see the program names QT3REQIO, QWSGET, and the program that issued a read operation. At the end of the transaction (such as when the program writes to the display), you see QT3REQIO, QWSPUT, and the program that wrote the display. Usually, the third or fourth program in the stack is the program shown in the transaction summary PGMNAME data. However, if the *Wait Code* column has a value, the program in the column labeled *Last* is the one that caused the trace record. If there is no program name in a column, the program name was the same as the previous one in the column, and the name is omitted.

Length of Wait
(Lock) The number of milliseconds the requester waited for the locked object.

Lgl I/O /Sec
(Job Interval) The average number of logical disk I/O operations performed per second by the job during the interval. This is calculated from the logical disk I/O count divided by the elapsed time.

Library
(System, Transaction) The library that contains the object.

LIBRARY
(Job Trace) The library name that contains the program associated with the trace entry.

Line Count
(Job Interval) The number of lines printed by the selected noninteractive jobs during the interval.

Line Descriptn
(Resource Interval) Line description name.

Line Errors
(Resource Interval) The total of all detected errors. Check the condition of the line if this value increases greatly over time.

Line Speed
(System, Resource Interval) The line speed in kilobits (1 kilobit = 1000 bits) per second.

Line Type/Line Name
(Component, System) The type and name of the line description that is used by the interface. For interfaces that do not use a line descriptions, the Line Name field will be shown as *LOOPBACK, *OPC, or *VIRTUALIP with no Line Type specified.

Line Util
(Resource Interval) The percent of available line capacity used by transmit and receive operations.

LKRL (Transaction) Lock Released. The job released a lock it had on the object named on the next detail line of the report (OBJECT --). The job that was waiting for the object is named on this line (WAITER --) along with the amount of time the job spent waiting for the lock to be released.

LKW (Transaction) Listed in the Wait Code column, Lock Wait. If there are a number of these, or you see entries with a significant length of time in the ACTIVE/RSP* column, additional analysis is necessary. The LKWT report lines that precede this LKW report line show you what object is being waited on, and who has the object.

LKWT

(Transaction) Listed in the Wait Code column, Lock Conflict Wait. The job is waiting on a lock conflict. The time (*/ time /*) is the duration of the lock conflict and, though not equal to the LKW time, should be very close to it. The holder of the lock is named at the right of the report line (HOLDER --). The object being locked is named on the next report line (OBJECT --).

Local End Code Violation

(Resource Interval) The number of times an unintended code violation was detected by the terminal equipment (TE) for frames received at the interface for the ISDN S/T reference point.

Local Not Ready

(Resource Interval) The percent of all receive-not-ready frames that were transmitted by the host system. A large percentage often means the host cannot process data fast enough (congestion).

Local work station IOP utilization

The fraction of the time interval the work station I/O processors are busy.

Local work station IOPs

(System) The resource name and model number for each local workstation IOP.

Lock Conflict

(Component) Number of lock exceptions per second. Database record contention is reflected in this count. For more information, issue the Start Performance Trace (STRPFRTRC) command and use the Print Transaction Report (PRTTNSRPT) and Print Lock Report (PRTLCKRPT) commands. This count could be very high, even under normal system operation. Use the count as a monitor. If there are large variations or changes, explore these variations in more detail.

Lock Wait /Tns

(Transaction) The average time, in seconds, of the lock-wait time per transaction. If the value is high, investigate with the transaction detail calculation and the Print Lock Report (PRTLCKRPT) command.

Logical

(Job Interval) The number of logical disk I/O operations performed by the selected interactive jobs during the interval.

Logical Database I/O Other

(System) Other logical database operations per transaction. This includes operations such as update and delete.

Logical Database I/O Read

(System) Logical database read operations per transaction.

Logical Database I/O Write

(System) Logical database write operations per transaction.

Logical DB I/O

(System) Average number of logical I/O operations per transaction.

Logical DB I/O Count

(System) Number of times an internal database I/O read, write, or miscellaneous function was called. This does not include I/O operations to readers, writers, or I/O operations caused by the Copy Spooled File (CPYSPLF) command or the Display Spooled File (DSPSPLF) command. If you specify SEQONLY(*YES), you see numbers that show each block of records read or written, not the number of individual records read or written. Miscellaneous functions include the following: updates, deletes, force-end-of-data, and releases.

Logical Disk I/O

(Component) Number of logical disk operations (Get, Put, Update, Other).

Logical I/O /Second

(System) Average number of logical disk I/O operations per second.

Logical I/O Per Second

(Job Interval) The average number of logical disk I/O operations performed per second by the selected noninteractive jobs during the interval.

Long Wait

(Transaction) The time the job spent waiting for a system resource. An example of a long wait would be a record-lock conflict. Also listed in the Elapsed Time--Seconds column, it is the elapsed time in the state (such as waiting for the next transaction or lock-wait time).

Long Wait Lck/Oth

(Transaction) The amount of time the job spent waiting for a system resource. An example of a long wait would be a record-lock conflict.

Loss of Frame Alignment

(Resource Interval) The number of times a time period equivalent to two 48-bit frames elapsed without detecting valid pairs of line code violations.

MAC Errors

(Resource Interval) The number of medium access control (MAC) errors.

Main storage (MB)

(System) The total main storage size, as measured in megabytes. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

Max Util

(System) Consistent use at or above the threshold value given will affect system performance and cause longer response times or less throughput.

Maximum

(Transaction) The maximum value of the item that occurred in the column.

Member

(System, Transaction) For the System Report, this is the name of the performance data member that was specified on the TOMBR parameter of the Create Performance Data (CRTPFRDTA) command. For the Transaction Report, the member that was involved in the conflict.

Minimum

(Transaction) The minimum value of the item that occurred in the column.

MRT Max Time

(System) The time spent waiting, after MRTMAX is reached, by jobs routed to a multiple requester terminal.

Note: No value appears in this column if job type is not MRT.

MSGS

(Job Trace) The number of messages sent to the job during each transaction.

MTU size (bytes)

(System) The size of the largest datagram that can be sent or received on the interface. The size is specified in octets (bytes). For interfaces that are used for transmitting network datagrams, this is the size of the largest network datagram that can be sent on the interface.

Nbr A-I

(Transaction) The number of active-to-ineligible state transitions by the job. This column shows the number of times that the job exceeded the time-slice value assigned to the job, and had to wait for an activity-level slot before the system could begin processing the transaction. If a value appears in this column, check the work that the job was doing, and determine if changes to the time-slice value are necessary.

Nbr Evt

(Transaction) The number of event waits that occurred during the job processing.

Nbr Jobs
>   (Transaction) The number of jobs.

Nbr Sign offs
>   (Transaction) The number of jobs that signed off during the interval.

Nbr Sign ons
>   (Transaction) The number of jobs that signed on during the interval.

Nbr Tns
>   (Transaction) The number of transactions in a given category.

>   **Note:** The values for transaction counts and other transaction-related information shown on the reports you produce using the Print Transaction Report (PRTTNSRPT) command may vary from the values shown on the reports you produce using the Print System Report (PRTSYSRPT) and Print Component Report (PRTCPTRPT) commands. These differences are caused because the PRTTNSRPT command uses trace data as input, while the PRTSYSRPT and PRTCPTRPT commands use sample data as input.

>   If there are significant differences in the values for transaction-related information shown on these reports, do not use the data until you investigate why these differences exist.

Nbr W-I
>   (Transaction) The number of wait-to-ineligible state transitions by the job. This column shows how many times the job had to wait for a transaction.

NDB Read
>   (Transaction) Listed in Physical I/O Counts column, it is the number of nondatabase read requests while the job was in that state. Listed in the Sync Disk I/O Rqs/Tns column, it is the average number of synchronous nondatabase read requests per transaction.

NDB Write
>   (Transaction) Listed in the Sync Disk I/O Rqs/Tns column, it is the average number of synchronous nondatabase write requests per transaction.

NDB Wrt
>   (Transaction) Listed in Physical I/O Counts column, the number of nondatabase write requests while the job was in that state. Listed under Synchronous Disk I/O Counts column, it is the number of synchronous nondatabase write requests per transaction.

NON-DB
>   (Job Trace) The number of physical nondatabase reads that occurred for the entry.

Non-DB Fault
>   (System, Component) Average number of nondatabase faults per second.

Non-DB Pages
>   (System, Component) Average number of nondatabase pages read per second.

NON-DB RDS
>   (Job Trace) The number of physical nondatabase reads that occurred.

Non SMAPP
>   (Component) Journal deposits not directly related to SMAPP (System Managed Access Path Protection).

Non-SSL Inbound Connect
>   (System) The number of non-SSL inbound connections accepted by the server.

Non-Unicast Packets Received
>   (System) The total number of non-unicast packets delivered to a higher-layer protocol for packets received on the specified interface.

Non-Unicast Packets Sent

(System) The total number of packets that higher-level protocols requested to be transmitted to a non-unicast address; therefore, this number includes those packets that were discarded or were not sent as well as those packets that were sent.

Number

(Transaction) The number of the job with which the transaction is associated.

Number I/Os per Second

(System) The number of I/Os per second for this particular IOP.

Number Jobs

(Transaction) The number of batch jobs in the job set.

Number Lck Cft

(Transaction) The number of lock-wait (including database record lock) state conflicts that occurred during the job processing. If this number is high, look at the Transaction and Transition Reports for the job to see how long the lock-wait state conflicts were lasting. In addition, you can do further investigation using the reports produced when you use the Print Lock Report (PRTLCKRPT) command.

Number Lck Conflict

(Transaction) The number of times the job had a lock conflict.

Number Locks

(Transaction) The number of locks attributed to interactive or noninteractive waiters.

Number of batch jobs

(System) The average number of active batch jobs. A batch job is considered active if it averages at least one I/O per 5 minutes.

Number of Jobs

(System) Number of jobs.

Number of Packets Received with Errors

(System) The total number of packets that were received with errors or discarded for other reasons. For example, a packet could be discarded to free up buffer space.

Number Seizes

(Transaction) The number of seizes attributed to interactive or noninteractive waiters.

Number Sze Cft

(Transaction) The number of seize/lock conflicts that occurred during the job processing. If this number is high, look at the Transaction and Transition Reports for the job to see how long the conflicts lasted, the qualified name of the job that held the object, the name and type of object being held, and what the job was waiting for.

Number Sze Conflict

(Transaction) The number of times the job had a seize conflict.

Number Tns

(System, Transaction) Total number of transactions processed. For example, in the System Report it is the total number of transactions processed by jobs in this pool. In the Transaction Report it is the number of transactions associated with the program.

Number Traces

(Batch Job Trace) Number of traces.

Number Transactions

(System) Total number of transactions processed.

Object File

(Transaction) The file that contains the object.

Object Library
> (Transaction) The library that contains the object.

Object Member
> (Transaction) The member that was involved in the conflict.

Object Name
> (Lock) The name of the locked object.

Object RRN
> (Transaction) The relative record number of the record involved in the conflict.

Object Type
> (Transaction, Lock) The type of the locked object. The following are possible object types:

> **AG**   Access group
>
> **CB**   Commit block
>
> **CBLK** Commit block
>
> **CD**   Controller description
>
> **CLS**   Class
>
> **CMD** Command
>
> **CTLD** Controller description
>
> **CTX**   Context
>
> **CUD** Control unit description
>
> **CUR** Cursor
>
> **DEVD**
> > Device description
>
> **DS**   Data space
>
> **DSI**   Data space index
>
> **DTAARA**
> > Data area
>
> **EDTD** Edit description
>
> **FILE** File
>
> **JOBD** Job description
>
> **JOBQ** Job queue
>
> **JP**   Journal port
>
> **JRN**   Journal
>
> **JRNRCV**
> > Journal receiver
>
> **JS**   Journal space
>
> **LIB**   Library
>
> **LIND** Line description
>
> **LUD** Logical unit description
>
> **MBR** Member
>
> **MEM** Database file member

MSGF Message file

MSGQ
    Message queue

ND   Network description

OCUR
    Database operational cursor

OUTQ
    Output queue

PGM   Program

PROG Program

PRTIMG
    Print image

QDAG
    Composite piece - access group

QDDS
    Composite piece - data space

QDDSI
    Composite piece - data space index

QTAG Temporary - access group

QTDS Temporary - data space

QTDSI
    Temporary - data space index

SBSD Subsystem description

TBL   Table

Omit Parameters
    (System, Component, Transaction, Job Interval, Pool Interval) The criteria used to choose the data
    records to be excluded from the report. The criteria are generally specified using an OMTxxx
    parameter of the command. Only nondefault values (something other than *NONE) are printed.
    If a parameter was not specified, it does not appear on the report.

Op per Second
    (System) Average number of disk operations per second.

Other Wait /Tns
    (Transaction) The average time, in seconds, spent waiting that was not in any of the previous
    categories per transaction. For example, the time spent waiting during a save/restore operation
    when the system requested new media (tape or diskette).

Outgoing Calls Pct Retry
    (Resource Interval) The percentage of outgoing calls that were rejected by the network.

Outgoing Calls Total
    (Resource Interval) The total number of outgoing call attempts.

Over commitment ratio
    (System) The main storage over commitment ratio (OCR).

PAG   (Transaction) The number of process access group faults.

PAG Fault
    (Component, Job Interval) In the Exception Occurrence Summary of the Component Report, it is

the total number of times the program access group (PAG) was referred to, but was not in main storage. The Licensed Internal Code no longer uses process access groups for caching data. Because of this implementation, the value will always be 0 for more current releases. In the Exception Occurrence Summary of the Component Report, it is the number of faults involving the process access group per second.

Page Count
(Job Interval) The number of pages printed by the selected noninteractive jobs during the interval.

Pct CPU By Categories
(Transaction) The percentage of available processing unit time used by the transactions that fell into the various categories. See the ANALYSIS by Interactive Transaction Categories part of the System Summary Data Section for an explanation of the categories.

Pct Data Characters Received in Error
(Resource Interval) The percent of data characters received with error.

Pct Data Characters Transmitted in Error
(Resource Interval) The percent of data characters transmitted with error.

Pct Datagrams Error
(Component) The percentage of datagrams that were discarded due to these errors:

- The IP address in the destination field of the IP header was not a valid address to be received at this entity.
- The protocol was unknown or unsupported.
- Not enough buffer space.

Pct Error Responses
(Component) Percentage of responses in error.

Pct Ex-Wt /Rsp
(Transaction) The percentage of the response time that is due to exceptional wait.

Pct ICMP Messages Error
(Component) This is the number of Internet Control Message Protocol (ICMP) messages that the entity received but determined that the messages had errors or are messages that the entity did not send due to problems.

Pct Of Tns Categories
(Transaction) The percentage of all transactions that fell into the various categories. See the Analysis by Interactive Transaction Categories part of the System Summary Data Section for an explanation of the categories.

Pct Packets Received Error
(System) The percentage of packets that were received with errors or discarded for other reasons. For example, a packet could be discarded to free up buffer space.

Pct Packets Sent Error
(System) The percentage of packets that were not sent because of errors or discarded for other reasons. For example, a packet could be discarded to free up buffer space.

Pct PDUs Received in Error
(Resource Interval) The percent of protocol data units (PDUs) received in error during the time interval. These errors can occur if the host system has errors or cannot receive data fast enough (congestion).

> **Note:** A protocol data unit (PDU) for asynchronous communications is a variable-length unit of data that is ended by a protocol control character or by the size of the buffer.

Pct Poll Retry Time
(Resource Interval) The percent of the time interval the line was unavailable while the IOP waited for a response from a work station controller (or remote system) that was in disconnect mode.

Note: To minimize this lost time:
- Vary on only the controllers that are turned on.
- Turn on all controllers.
- Use the Change Line Description (SDLC) (CHGLINSDLC) command to set the connect poll timer to a small value (reduces wait time).
- Use the Change Controller Description (CHGCTLxxxx) command (where xxxx is APPC, FNC, RWS, or RTL, as appropriate) to set the NDMPOLLTMR value to a large value (increases time between polls).

Pct Tns

(Transaction) The percentage of the total transactions. For the System Summary section of the Job Summary Report, the transactions are within the given trace period with the given purge attribute. For the Interactive Program Transaction Statistics section of the Job Summary Report, the percentage of transactions that were associated with a program. For the Job Statistics section, it is the percentage of total transactions that were due to this job. For the Interactive Program Statistics section, it is all transactions that were associated to a program.

Pct UDP Datagrams Error

(Component) The percentage of User Datagram Protocol (UDP) datagrams for which there was no application at the destination port or that could not be delivered for other reasons.

Percent Errored Seconds

(Resource Interval) The percentage of seconds in which at least one Detected Access Transmission (DTSE) in or out error occurred.

Percent Frames Received in Error

(Resource Interval) The percent of all received frames that were received in error. Errors can occur when the host system has an error or cannot process received data fast enough (congestion).

Percent Full

(System) Percentage of disk space capacity in use.

Percent I Frames Trnsmitd in Error

(Resource Interval) The percent of transmitted information frames that required retransmission. Retransmissions can occur when a remote device has an error or cannot process received data fast enough (congestion).

Percent Severely Errored Seconds

(Resource Interval) The percent of seconds in which at least three Detected Access Transmission (DTSE) in or out errors occurred.

Percent transactions (dynamic no)

(System) A measure of system main storage utilization. The percent of all interactive transactions that were done with the purge attribute of dynamic NO.

Percent transactions (purge no)

(System) A measure of system main storage utilization. The percent of all interactive transactions that were done with the purge attribute of NO.

Percent transactions (purge yes)

(System) A measure of system main storage utilization. The percent of all interactive transactions that were done with the purge attribute of YES.

Percent Util

(System) Average disk arm utilization (busy). Consistent use at or above the threshold value provided for disk arm utilization affects system performance, which causes longer response times or less throughput.

Note: The percent busy value is calculated from data measured in the I/O processor. When comparing this value with percent busy reported by the Work with Disk Status

(WRKDSKSTS) command, some differences may exist. The WRKDSKSTS command estimates percent busy based on the number of I/O requests, amount of data transferred, and type of disk unit.

The system-wide average utilization does not include data for mirrored arms in measurement intervals for which such intervals are either in resuming or suspended status.

Perm Size
(Component) Kilobytes placed within the permanent area; these are traditional journal entries which can be retrieved and displayed.

Perm Write
(Component, Job Interval) The number of permanent write operations performed for the selected jobs during the interval.

Permanent writes per transaction
(System) The average number of permanent write operations per interactive transaction.

Physical I/O Count
(Transaction, Batch Job Trace) For the Job Summary section of the Batch Job Trace Report, the number of synchronous and asynchronous disk operations (reads and writes). For the Transition Report, the next five columns provide information about the number of synchronous and asynchronous disk I/O requests while the job was in the given state. The first line is the synchronous disk I/O requests, and the second line is the asynchronous disk I/O requests.

DB Read
The number of database read requests while the job was in that state.

DB Wrt
The number of database write requests while the job was in that state.

NDB Read
The number of nondatabase read requests while the job was in that state.

NDB Wrt
The number of nondatabase write requests while the job was in that state.

Tot The total number of DB Read, DB Wrt, NDB Read, and NDB Wrt requests.

Physical Writes
(Component) Physical journal write operations to disk.

Pl (Component, Transaction, Job Interval, Pool Interval) The number of the pool in which the subsystem or job ran.

Pool (Transaction, Job Interval, Batch Job Trace) The number of the pool containing the transaction (for example, in which the job ran.)

Pool ID
(System) Pool identifier.

Pool ID Faults
(Component) User pool that had the highest page fault rate.

Pool Mch Faults/Sec
(Component) Average number of machine pool page faults per second.

Pool size (MB)
(Component) For the Storage Pool Activity section of the Component Report it is the initial pool size in megabytes.

Pool User Faults/Sec
(Component) Average number of user pool page faults per second, for the user pool with highest fault rate during this interval.

Pools   (System, Component, Transaction, Job Interval, Pool Interval) In the Report-Selection Criteria section, the list of pools selected to be included (SLTPOOLS parameter) or excluded (OMTPOOLS parameter). Otherwise, the pools you specify. The values can be from 1 through 64.

Prg   (Transaction) The purge attribute of the jobs.

Printer Lines
(System, Job Interval) The number of lines printed by the job during the interval.

Printer Pages
(System, Job Interval) The number of pages printed by the job during the interval.

Priority
(System, Transaction) The priority of the job.

Program
(Transaction) The name of the program with which the transaction is associated.

PROGRAM
(Job Trace) The name of the program for the entry.

PROGRAM CALL
(Job Trace) The number of non-QSYS library programs called during the step. This is not the number of times that the program named in the PROGRAM NAME field was called.

PROGRAM DATABASE I/O
(Job Trace) The number of times the IBM-supplied database modules were used during the transaction. The database module names have had the QDB prefix removed (PUT instead of QDBPUT). The type of logical I/O operation performed by each is as follows:

GETDR
Get direct

GETSQ
Get sequential

GETKY
Get by key

GETM
Get multiple

PUT, PUTM
Add a record

UDR   Update, delete, or release a record

PROGRAM INIT
(Job Trace) The number of times that the IBM-supplied initialization program was called during the transaction. For RPG programs this is QRGXINIT, for COBOL it is QCRMAIN. Each time the user program ends with LR (RPG) or END (COBOL), the IBM-supplied program is also called. This is not the number of times the program named in the PROGRAM NAME field was initialized. QCRMAIN is used for functions other than program initialization (for example, blocked record I/O, some data conversions).

Program Name
(Transaction) For the Job Summary section of the Transaction Report, the name of the program in control at the start of the transaction. Other programs may be used during the transaction. For the Transaction Report section, the name of the program active at the start of the transaction. If ADR=UNKNWN (address unknown) is shown under the column, the program was deleted before the trace data was dumped to the database file. If ADR=000000 is shown under the column, there was not enough trace data to determine the program name, or there was no program active at that level in the job when the trace record was created.

PROGRAM NAME
(Job Trace) The name of the last program called that was not in the library QSYS before the end of a transaction.

Protocol
(System) Line protocol.
- SDLC
- ASYNC
- BSC
- X25
- TRLAN
- ELAN (Ethernet)
- IDLC
- DDI
- FRLY
- PPP

Pty (Component, Transaction, Job Interval) Priority of the job. For the Concurrent Batch Job Statistics section of the Transaction Report, it is the priority of the jobs in the job set.

Purge (Transaction) The purge attribute of the jobs.

PWrt (Transaction) The number of permanent write I/O operations.

Queue Length
(Resource Interval) The average number of I/O requests that had to wait in the queue for this unit.

Rank (Transaction) The order. For the Job Summary section, it is the order of the program according to the number of transactions. For the Job Statistics section, it is the order of the job. For the Interactive Program Statistics section, it is the order of the program. For the Individual Transaction Statistics section, it is the order of the transaction according to the data being put in order by importance. For the Largest Seize/Lock Conflicts section, it is the order of the seize or lock conflict.

Ratio of write disk I/O to total disk I/O
(System) The fraction of the total disk activity that is due to writing data to the disks.

Reads per Second
(Resource Interval) The average number of disk read operations performed per second by the disk arm.

Receive CRC Errors
(Resource Interval) The number of received frames that contained a cycle redundancy check (CRC) error. This indicates that the data was not received error free.

Record Number
(Lock) For database file members, the relative record number of the record within the database file member.

Remote LAN Pct Frames Recd
(Resource Interval) The number of frames received from a local area network (LAN) connected to the locally attached LAN.

Remote LAN Pct Frames Trnsmitd
(Resource Interval) The number of frames transmitted to a local area network (LAN) connected to the locally attached LAN.

Remote Not Ready
> (Resource Interval) The percentage of all receive-not-ready frames that were received by the host system. A large percentage often means the remote device cannot process data fast enough (congestion).

Remote Seq Error
> (Resource Interval) The percent of frames received out of order by a remote device or system. This can occur when the remote device or system cannot process data fast enough.

Req type
> (Component) The type of request being reported.

Requests received
> (System, Component) The number of requests of all types received by the server.

Requestor's Job Name
> (Lock) The name of the job requesting the locked object (the same as in the detail listing).

Reset Packets Recd
> (Resource Interval) The number of reset packets received by the network. **Reset packets** are packets retransmitted because an error occurred.

Reset Packets Trnsmitd
> (Resource Interval) The number of reset packets transmitted by the network.

Response
> (System) Average system response (service) time.

Response Sec Avg and Max
> (Transaction) The average (AVG) and maximum (MAX) transaction response time, in seconds, for the job. The average response time is calculated as the sum of the time between each pair of wait-to-active and active-to-wait transitions divided by the number of pairs that were encountered for the job. The MAX response time is the largest response time in the job.

Response Seconds
> (System) Average response time in seconds per transaction.

Responses sent
> (System, Component) The number of responses of all types sent by the server.

Rsp   (Component) Average interactive transaction response time in seconds.

Rsp Time
> (Component, Resource Interval) The average external response time (in seconds). For the Local Work Station IOP Utilizations section of the Resource Interval Report, it is the response time for work stations on this controller. For the Remote Work Stations section of the Component Report, it is the response time for this work station.

Rsp Timer Ended
> (Resource Interval) The number of times the response timer ended waiting for a response from a remote device.

Rsp/Tns
> (Component, Transaction, Job Interval) The average response time (seconds) per transaction. For the Job Summary section of the Job Interval Report, it is the response time per transaction for the selected interactive jobs during the interval (the amount of time spent waiting for or using the system resources divided by the number of transactions processed). This number will not be accurate unless at least several seconds were spent processing transactions.

S/L   (Transaction) Whether the conflict was a seize (S) or lock (L) conflict.

SECONDS
> (Job Trace) The approximate time the job was waiting or active.

Segments Pct Rtrns

(Component) The percentage of segments retransmitted. This number is the TCP segments that were transmitted and that contain one or more previously transmitted octets (bytes).

Segments Rcvd per Second

(Component) The number of segments received per second. This number includes those received in error and those received on currently established connections.

Segments Sent per Second

(Component) The number of segments sent per second. This number includes those sent on currently established connections and excludes those that contain only retransmitted octets (bytes).

Seize and Lock Conflicts

(Batch Job Trace) Number of seize conflicts and lock waits.

Seize Conflict

(Component) Number of seize exceptions per second. For more detailed information, issue the Start Performance Trace (STRPFRTRC) command, and use the PRTTNSRPT or PRTLCKRPT commands. This count could be very high, even under normal system operation. Use the count as a monitor. If there are large variations or changes, explore these variations in more detail.

Seize Hold Time

(Transaction) The amount of time that the transaction held up other jobs in the system by a seize or lock on an object.

Seize Wait /Tns

(Transaction) The average time, in seconds, for all seize-lock conflicts that occur during an average transaction. More than one seize-lock conflict can occur during a single transaction for the same job. If this number is high, investigate those jobs with seize conflicts. The Transaction Report lists each conflict that occurs, the name of the holder, and the name of the object held. For the Transaction by 5-Minute Intervals section of the Job Summary Report, it is the average seize wait time per transaction in seconds. This is the average amount of time that the transactions spent in a seize/lock conflict. If this number is high, look at the Transaction and Transition Reports for the jobs that are causing the excessive wait time.

Select Parameters

(System, Component, Transaction, Job Interval, Pool Interval) The criteria used to choose the data records to be included in the report. The criteria are generally specified using an SLTxxx parameter of the command. Only nondefault values (something other than *ALL) are printed. If a parameter is not specified, it does not appear on the report.

SEQNBR

(Job Trace) The number of the trace entry.

SEQNCE or SEQUENCE

(Job Trace) The job trace sequence number in the detail report that this summary line refers to.

Sequence Error

(Resource Interval) The number of frames received that contained sequence numbers indicating that frames were lost.

Server job name

(System) The server job number. Identifies the child job for the server.

Server job user

(System) The server job user. Identifies the child job for the server.

Server name

(System) The server job name. Identifies the child job for the server.

Server start date/time

(System) The most recent start or restart time in format mm/dd/yy hh:mm:ss

Short Frame Errors

(Resource Interval) The number of short frames received. A short frame is a frame that has fewer octets between its start flag and end flag than are permitted.

Short Wait /Tns

(Transaction) The average time, in seconds, of short (active) wait time per transaction. For the Interactive Program Statistics section, if the value is high, it may be due to the use of data queues or to the use of DFRWRT(*NO) or RSTDSP(*YES) in the program display files.

Short WaitX /Tns (Short wait extended)

(Transaction) The average time, in seconds, of wait time per transaction that resulted due to a short (active) wait that exceeded 2 seconds, and caused a long wait transition to occur. The activity level has been released but this time is still counted against your total response time. Waits on data queues or the use of DFRWRT(*NO) and/or RSTDSP(*YES) in the display files could be reasons for this value to be high.

Size   (Component) Decimal data overflow and underflow exceptions per second. An indication of improper field size on numeric calculations.

Size (MB)

(System) The size of the pool in megabytes.

Size (GB)

(Pool Interval) The size of the pool in gigabytes.

Size (M)

(System) Disk space capacity in millions of bytes.

SHARE CLS

(Job Trace) The number of shared closes for all types of files.

SHARE OPN

(Job Trace) The number of shared opens for all types of files.

SMAPP ReTune

(Component) System-managed access path protection tuning adjustments.

SMAPP System

(Component) SMAPP-induced journal entries deposited in system-provided (default) journals.

SMAPP User

(Component) SMAPP-induced journal entries deposited in user-provided journals.

SOTn (Transaction) Listed in the Wait Code column, Start of transaction n. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

Spool CPU seconds per I/O

(System) The average number of system processing unit seconds used by all spool jobs for each I/O performed by a spool job.

Spool database reads per second

(System) The average number of read operations to database files per second of spool processing.

Spool I/O per second

(System) The average number of physical disk I/O operations per second of spool processing.

Srv Time

(Component) Average disk service time per request in seconds not including the disk wait time.

SSL Inbound Connections

(System) AThe number of SSL inbound connections accepted by the server.

Start   (Transaction) The time the job started.

Started
(Transaction) The time of the first record in the trace data, in the form HH.MM.SS (hours, minutes, seconds).

State (Transaction) The three possible job states are:
- **W**--(Wait state) not holding an activity level.
- **A**--(Active or wait state) holding an activity level.
- **I**--(Ineligible state) waiting for an activity level.

The table below shows the possible job state transitions. For example, from **W** to **A** is **y**, or yes, which means it is possible for a job to change from the *wait* state to the *active* state.

		To state		
		A	**W**	**I**
From	**A**	y	y	y
State	**W**	y	-	y
	I	y	-	-

State Transitions A-A
(Batch Job Trace) Number of active-to-active transitions.

State Transitions A-I
(Batch Job Trace) Number of active-to-ineligible transitions.

Stop (Transaction) The time the job ended.

Stopped
(Transaction) The time of the last record in the trace data, in the form HH.MM.SS (hours, minutes, seconds).

SUBFILE READS
(Job Trace) The number of subfile reads.

SUBFILE WRITES
(Job Trace) The number of subfile writes.

Subsystem Name
(Pool Interval) The name of the subsystem.

Subsystems
(System, Component, Pool Interval) For the System Report, the subsystem names you specify. Each name is a 10-character name. For the Component Report, the list of subsystems selected to be included (SLTSBS parameter) or excluded (OMTSBS parameter).

Sum (Transaction) Listed in the Sync Disk I/O Rqs/Tns column, the sum of the averages of the synchronous DB READ, DB WRITE, NDB READ, and NDB WRITE requests (the average number of synchronous I/O requests per transaction for the job).

SWX (Transaction) Listed in the Wait Code column, Short Wait Extended. The short wait has exceeded a 2-second limit and the system has put the transaction into a long wait. This long wait must be charged to the transaction response time. In most cases, this active-to-wait transaction does not reflect a transaction boundary.

Sync (Job Interval) The number of synchronous disk I/O operations performed by the selected interactive jobs during the interval.

Sync DIO /Tns
(Transaction) The average number of synchronous I/O requests per transaction during the interval.

Sync Disk I/O
(System, Component, Transaction) Synchronous disk I/O operations.

Sync Disk I/O per Second
> (Component) Average synchronous disk I/O operations per second.

Sync Disk I/O Requests
> (Transaction) The total number of synchronous disk I/O requests for the given combination of priority, job type, and pool.

Sync Disk I/O Rqs/Tns
> (Transaction) The next five columns provide information about the number of synchronous disk I/O requests per transaction:

> **DB Read**
>> The average number of synchronous database read requests per transaction.

> **DB Write**
>> The average number of synchronous database write requests per transaction.

> **NDB Read**
>> The average number of synchronous nondatabase read requests per transaction.

> **NDB Write**
>> The average number of synchronous nondatabase write requests per transaction.

> **Sum**   The sum of the averages of the synchronous DB READ, DB WRITE, NDB READ, and NDB WRITE requests (the average number of synchronous I/O requests per transaction for the job).

Sync I/O /Elp Sec
> (Transaction) The average number of synchronous disk I/O requests for all jobs, per second of elapsed time used by the jobs.

Sync I/O /Sec
> (Job Interval) The average number of synchronous disk I/O operations performed per second by the job during the interval. This is calculated from the synchronous disk I/O count divided by the elapsed time.

Sync I/O Per Second
> (Job Interval) The average number of synchronous disk I/O operations performed per second by the selected noninteractive jobs during the interval.

Synchronous DBR
> (System, Transaction, Job Interval, Pool Interval) The average number of synchronous database read operations. It is the total synchronous database reads divided by the total transactions. For the Pool Interval and Job Interval Reports, it is calculated per transaction for the job during the intervals. For the System Report, it is calculated per second. For the Transaction (Job Summary) it is calculated per transaction. Listed under Average DIO/Transaction, the average number of synchronous database read requests per transaction. This field is not printed if the jobs in the system did not process any transactions.

Synchronous DBW
> (System, Transaction, Job Interval, Pool Interval) The average number of synchronous database write operations. It is the total synchronous database writes divided by the total transactions. For the Pool Interval and Job Interval Reports, it is calculated per transaction for the job during the intervals. For the System Report, it is calculated per second. For the Transaction (Job Summary) it is calculated per transaction. Listed under Average DIO/Transaction, the average number of synchronous database read requests per transaction. This field is not printed if the jobs in the system did not process any transactions.

Synchronous DIO / Act Sec
> (System, Transaction) The number of synchronous disk I/O operations per active second. The active time is the elapsed time minus the wait times.

Synchronous DIO / Ded Sec

(Transaction) The estimated number of synchronous disk I/O operations per second as if the job were running in dedicated mode. Dedicated mode means that no other job would be active or in contention for resources in the system.

Synchronous DIO / Elp Sec

(Transaction) The number of synchronous disk I/O operations per elapsed second.

Synchronous Disk I/O Counts

(Transaction) The next five columns provide information about the number of synchronous disk I/O requests per transaction:

DB Read

The number of synchronous database read requests per transaction.

DB Wrt

The number of synchronous database write requests per transaction.

NDB Read

The number of synchronous nondatabase read requests per transaction.

NDB Wrt

The number of synchronous nondatabase write requests per transaction.

Sum The sum of the synchronous DB Read, DB Wrt, NDB Read, and NDB Wrt requests (the number of synchronous I/O requests per transaction).

Synchronous disk I/O per transaction

(System, Transaction) The average number of synchronous physical disk I/O operations per interactive transaction.

Synchronous Max

(Transaction) The maximum number of synchronous DBR, NDBR, and WRT I/O requests encountered for any single transaction by that job. If the job is not an interactive or autostart job type, the total disk I/O for the job is listed here.

Synchronous NDBR

(System, Transaction, Job Interval, Pool Interval) The average number of synchronous nondatabase read operations per transaction for the jobs in the system during the interval. For the Transaction Report, the operations on the disk per transaction for the selected jobs in the pool. This is calculated from the synchronous nondatabase read count divided by the transactions processed. This field is not printed if the jobs in the system did not process any transactions.

Synchronous NDBW

(System, Job Interval, Pool Interval) The average number of synchronous nondatabase write operations on the disk per transaction for the selected jobs in the pool. For the System Report, it is the operations per transaction for the jobs in the system during the interval. This is calculated from the synchronous nondatabase write count divided by the transactions processed. This field is not printed if the jobs in the system did not process any transactions.

Synchronous Sum

(Transaction) The sum of the averages of the synchronous DBR, NDBR, and WRT requests (the average number of synchronous I/O requests per transaction for the job).

Synchronous wrt

(Transaction) The average number of synchronous database and nondatabase write requests per transaction.

System CPU per transaction (seconds)

(System) The average number of system processing unit seconds per interactive transaction.

System disk I/O per transaction

(System) The total number of physical disk I/O operations attributed to the system per interactive transaction.

System Starts

(Component) The number of start journal operations initiated by the system.

System Stops

(Component) The number of stop journal operations initiated by the system.

System Total

(Component) The total number of journal deposits resulting from system-journaled objects. These are the deposits performed by system-managed access path protection (SMAPP).

System ToUser

(Component) The number of journal deposits resulting from system-journaled objects to user-created journals.

SZWG

(Transaction) Listed in the Wait Code column, Seize Wait Granted. The job was waiting on a seize conflict. The original holder released the lock that it had on the object, and the lock was then granted to the waiting job. The job that was waiting for the object is named on this line (WAITER --) along with the amount of time the job spent waiting for the seize conflict to be released. The object that is held is named on the next line of the report (OBJECT --).

SZWT (Transaction) Listed in the Wait Code column, Seize/Lock Conflict Wait. The job is waiting on a seize/lock conflict. The time (*/ time /*) is the duration of the seize/lock conflict, and is included in the active time that follows it on the report. The holder of the lock is named at the right of the report line (HOLDER --). The object being held is named on the next report line (OBJECT --).

Teraspace EAO

(Component) Listed in the Exception Occurrence summary and Interval Counts. A teraspace effective address overflow (EAO) occurs when computing a teraspace address that crosses a 16-boundary. A quick estimate indicates that a 1% performance degradation would occur if there were 2,300 EAOs per second.

Thread

(Job Summary, Transaction, Transition) A thread is a unique flow of control within a process. Every job has an initial thread associated with it. Each job can start one or more secondary threads. The system assigns the thread number to a job as follows:

- The system assigns thread IDs sequentially. When a job is started that uses a job structure that was previously active, the thread ID that is assigned to the initial thread is the next number in the sequence.

- The first thread of a job is assigned a number.

- Any additional threads from the same job are assigned a number that is incremented by 1. For example:

```
Job Name    User Name/  Job Number
            Thread
QJVACMDSRV    SMITH       023416
QJVACMDSRV    00000006    023416
QJVACMDSRV    00000007    023416
QJVACMDSRV    00000008    023416
```

A thread value greater than 1 does not necessarily mean the job has had that many threads active at the same time. To determine how many threads are currently active for the same job, use the WRKACTJOB, WRKSBSJOB, or WRKUSRJOB commands to find the multiple three-part identifiers with the same job name.

Threads active

(System) The number of threads doing work when the data was sampled.

Threads idle

(System) The number of idle threads when the data was sampled.

Time (Transaction) The time when the transaction completed, or when a seize or lock conflict occurred. Also, a column heading that shows the time the transition from one state to another occurred, in the HH.MM.SS.mmm arrangement.

TIME (Job Trace) The time of day for the trace entry. The time is sequentially given in hours, minutes, seconds, and microseconds.

Tns (Component, Pool Interval) The total number of transactions processed by the selected jobs in the pool or subsystem.

Tns Count

(Component, Job Interval) The number of transactions performed by the selected interactive jobs during the interval.

Tns/Hour

(Component, Transaction, Job Interval) The average number of transactions per hour processed by the selected interactive jobs during the interval.

Tns/Hour Rate

(System) Average number of transactions per hour.

TOD of Wait

(Lock) The time of day of the start of the conflict.

Tot (Transaction) Listed in Physical I/O Counts column, the total number of DB Read, DB Wrt, NDB Read, and NDB Wrt requests.

Tot Nbr Tns

(Transaction) The total number of transactions the PRTTNSRPT program determined from the input data that were accomplished for the job.

Total (Component) Total exception counts for the reporting period.

TOTAL

(Job Trace) Totals for the fields.

Total /Job

(Transaction) The total (sum) of the items in the column for the job.

Total characters per transaction

(System) The average number of characters either read from or written to display station screens per interactive transaction.

Total CPU Sec /Sync DIO

(Transaction) The ratio of total CPU seconds divided by the total synchronous disk I/O requests.

Total CPU Utilization

(System, Component) Percentage of available processing unit time used by the partition. For a multiple-processor system, this is the average use across all processors. For dedicated partitions, *Total CPU Utilization* is replaced by a utilization value for each processor in the partition. Here is an example of this part of the display for a dedicated partition with two processors:

```
Average CPU utilization  . . . . . :    41.9
CPU 1 utilization  . . . . . . . . :    41.7
CPU 2 utilization  . . . . . . . . :    42.2
```

In shared processor partitions, individual CPU utilization rows are not printed.

Note: This value is taken from a system counter. Other processing unit uses are taken from the individual job work control blocks (WCBs). These totals may differ slightly. For uncapped partitions, *Total CPU utilization* might exceed 100 percent.

Total CPU Utilization (Database Capability)
> (System) Shows you the DB2 Universal Database™ for iSeries activity on your systems. This field applies to all systems running V4R5 or later and includes all database activity, including all SQL and data I/O operations.

Total CPU Utilization (Interactive Feature)
> (System) The CPU Utilization (Interactive Feature) shows the CPU utilization for all jobs doing 5250 workstation I/O operations relative to the capacity of the system for interactive work. Depending on the system and associated features purchased, the interactive capacity is equal to or less than the total capacity of the system.

Total Data Characters Received
> (Resource Interval) The number of data characters received successfully.

Total Data Characters Transmitted
> (Resource Interval) The number of data characters transmitted successfully.

Total Datagrams Requested for Transmission
> (Component) The percentage of IP datagrams that are discarded because of the following reasons:
>
> - No route was found to transmit the datagrams to their destination.
> - Lack of buffer space.

Total fields per transaction
> (System) The average number of display station fields either read from or written to per interactive transaction.

Total Frames Recd
> (Resource Interval) The number of frames received, including frames with errors and frames that are not valid.

Total I Frames Trnsmitd
> (Resource Interval) The total number of information frames transmitted.

Total I/O
> (System) Sum of the read and write operations.

Total PDUs Received
> (Resource Interval) The number of protocol data units (PDUs) received during the time interval.
>
> **Note:** A protocol data unit (PDU) for asynchronous communications is a variable-length unit of data that is ended by a protocol control character or by the size of the buffer.

Total Physical I/O per Second
> (Resource Interval) The average number of physical disk I/O operations performed per second by the disk arm.

Total Responses
> (Component, Resource Interval) The total number of transactions counted along with the average response time for all active work stations or devices on this controller for the report period.

Total Seize/Wait Time
> (Component) The response time in milliseconds for each job.

Total Tns
> (Component) Number of transactions processed in this pool.

Transaction Response Time (Sec/Tns)
> (Transaction) The response time in seconds for each transaction. This value includes no communications line time. Response times measured at the work station exceed this time by the data transmission time (the time required to transmit data from the work station to the processing unit and to transmit the response data back to the work station from the processing unit).

Transactions per hour (local)
> (System) The interactive transactions per hour attributed to local display stations.

Transactions per hour (remote)
> (System) The interactive transactions per hour attributed to remote display stations.

Transient Size
> (Component) Kilobytes placed within the journal transient area; these are hidden journal entries produced by the system.

Transmit/Receive/Average Line Util
> (Resource Interval) In duplex mode, the percentage of transmit line capacity used, the percentage of receive line capacity used, and the average of the transmit and receive capacities.

TSE (Transaction) Listed in the Wait Code column, Time Slice End. The program shown in the stack entry labeled LAST is the program that went to time slice end.

Typ (Component, Transaction) The system job type and subtype. The Component Report allows only one character in this column. The Transaction Report allows two characters. The Transaction Report reports the job type and job subtype directly from the QAPMJOBS fields. The Component Report takes the job type and job subtype values and converts it to a character that may or may not be the value from the QAPMJOBS field. The possible job types are:

A Autostart

B Batch

BD Batch immediate (Transaction only)

> **Note:** The batch immediate values are shown as BCI on the Work with Active Job display and as BATCHI on the Work with Subsystem Job display.

BE Batch evoke (Transaction only)

BJ Batch pre-start job (Transaction only)

C Programmable work station application server, which includes 5250 emulation over APPC and iSeries Access host servers running either APPC or TCP/IP. You can find the host server information under the Host server administration topic in the iSeries Information Center. A job is reported as a iSeries Access server if any of the following items are true:
- Incoming APPC evoke requests one of the server program names. This also applies to the pre-started jobs for the QSERVER, QCMN, and QSYSWRK subsystems that are already waiting for the named program.
- Incoming IP port number corresponds to one of the service name-description-port-numbers. This also applies to the pre-started jobs for the QSERVER, QCMN, and QSYSWRK subsystems that are already waiting for the assigned IP port number.
- Incoming IPX socket number corresponds to one of the service name-description-port-numbers. This also applies to the pre-started jobs for the QSERVER, QCMN, and QSYSWRK subsystems that are already waiting for the assigned IPX port number.
- Incoming 5250 display emulation jobs that come from APPC data streams sent by 5250 emulation under OS/2 Communications Manager or WARP equivalent.

D Target distributed data management (DDM) server

I Interactive. For the Component Report, this includes twinaxial data link control (TDLC), 5250 remote workstation, and 3270 remote workstation. For the Transaction Report, this includes twinaxial data link control (TDLC), 5250 remote workstation, 3270 remote workstation, SNA pass-through, and 5250 Telnet.

L Licensed Internal Code Task

M Subsystem monitor

P   SNA pass-through and 5250 Telnet pass-through. On the Transaction Report, these jobs appear as I (interactive).

R   Spool reader

S   System

W   Spool writer, which includes the spool write job, and if Advanced Function Printing (AFP) is specified, the print driver job.

WP   Spool print driver (Transaction only)

X   Start the system

The possible job subtypes are:

D   Batch immediate job

E   Evoke (communications batch)

J   Pre-start job

P   Print driver job

T   Multiple requester terminal (MRT) (System/36 environment only)

3   System/36

Notes:
1. Job subtypes do not appear on the Component Report.
2. If the job type is blank or you want to reassign it, use the Change Job Type (CHGJOBTYP) command to assign an appropriate job type.

Type   (System, Transaction, Job Interval) One of the transaction types listed in the description of the DTNTY field.

(System)
The disk type.

(Transaction)
The type and subtype of the job.

(Transaction)
For the Seize/Lock Conflicts by Object section, the type of seize/lock conflict.

UDP Datagrams Received
(Component) The total number of User Datagram Protocol (UDP) datagrams delivered to UDP users.

UDP Datagrams Sent
(Component) The total number of User Datagram Protocol (UDP) datagrams sent from this entity.

Uncap CPU Avail
(Component)Percentage of CPU time available to a partition in the shared processors pool during the interval in addition to its configured CPU. This value is relative to the configured CPU available for the particular partition.

Unicast Packets Received
(System) The total number of subnetwork-unicast packets delivered to a higher-layer protocol. The number includes only packets received on the specified interface.

Unicast Packets Sent
(System) The total number of packets that higher-level protocols requested to be transmitted to a subnetwork-unicast address. This number includes those packets that were discarded or were not sent.

Unit (System, Component, Resource Interval) The number assigned by the system to identify a specific disk unit or arm. An 'A' or 'B' following the unit number indicates that the disk unit is mirrored. (For example, 0001A and 0001B are a mirrored pair.)

Unit Name
The resource name of the disk arm.

User ID
(System, Component, Transaction, Job Interval, Pool) The list of users selected to be included (SLTUSRID parameter) or excluded (OMTUSRID parameter).

User Name
(Component, Transaction, Job Interval, Batch Job Trace) Name of the user involved (submitted the job, had a conflict, and so on.)

User Name/Thread
(Component, Transaction) If the job information contains a secondary thread, then this column shows the thread identifier. If the job information does not contain a secondary thread, then the column shows the user name. The system assigns the thread number to a job as follows:

- The system assigns thread IDs sequentially. When a job is started that uses a job structure that was previously active, the thread ID that is assigned to the initial thread is the next number in the sequence.
- The first thread of a job is assigned a number.
- Any additional threads from the same job are assigned a number that is incremented by 1. For example:

```
Job Name    User Name/   Job Number
             Thread
QJVACMDSRV   SMITH        023416
QJVACMDSRV    00000006    023416
QJVACMDSRV    00000007    023416
QJVACMDSRV    00000008    023416
```

A thread value greater than 1 does not necessarily mean the job has had that many threads active at the same time. To determine how many threads are currently active for the same job, use the WRKACTJOB, WRKSBSJOB, or WRKUSRJOB commands to find the multiple three-part identifiers with the same job name.

User Starts
(Component) The number of start journal operations initiated by the user.

User Stops
(Component) The number of stop journal operations initiated by the user.

User Total
(Component) The total number of journal deposits resulting from system-journaled objects.

Util (Component, Resource Interval) The percent of utilization for each local work station, disk, or communications IOP, controller, or drive.

   Note: The system-wide average utilization does not include data for mirrored arms in measurement intervals for which such intervals are either in resuming or suspended status.

Util 2 (Component, Resource) Utilization of co-processor.

Value (Transaction) For the Individual Transaction Statistics section of the Job Summary report, it is the value of the data being compared for the transaction. For the Longest Seize/Lock Conflicts section, it is the number of seconds in which the seize or lock conflict occurred.

Verify (Component) Number of verify exceptions per second. Verify exceptions occur when a pointer needs to be resolved, when blocked MI instructions are used at security levels 10, 20, or 30, and

when an unresolved symbolic name is called. This count could be very high, even under normal system operation. Use the count as a monitor. If there are large variations or changes, explore these variations in more detail.

W-I Wait/Tns

(Transaction) The average time, in seconds, of wait-to-ineligible time per transaction. This value is an indication of what effect the activity level has on response time. If this value is low, the number of wait-to-ineligible transitions probably has little effect on response time. If the value is high, adding additional interactive pool storage and increasing the interactive pool activity level should improve response time. If you are unable to increase the interactive pool storage (due to limited available storage), increasing the activity level may also improve response time. However, increasing the activity level might result in excessive faulting within the storage pool.

Wait Code

(Transaction) The job state transition that causes the trace record to be produced. The values can be as follows:

EVT Event Wait. A long wait that occurs when waiting on a message queue.

EOTn End of transaction for transaction for type n. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

EORn End of response time for transaction n. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

Error Responses

(Component> The number of responses in error.

HDW Hold Wait (job suspended or system request).

LKRL Lock Released. The job released a lock it had on the object named on the next detail line of the report (OBJECT --). The job that was waiting for the object is named on this line (WAITER --) along with the amount of time the job spent waiting for the lock to be released.

LKW Lock Wait. If there are a number of these, or you see entries with a significant length of time in the ACTIVE/RSP* column, additional analysis is necessary. The LKWT report lines that precede this LKW report line show you what object is being waited on, and who has the object.

LKWT

Lock Conflict Wait. The job is waiting on a lock conflict. The time (*/ time /*) is the duration of the lock conflict and, though not equal to the LKW time, should be very close to it. The holder of the lock is named at the right of the report line (HOLDER --). The object being locked is named on the next report line (OBJECT --).

SOTn Start of transaction n. These codes are in the wait code column, but they are not wait codes. They indicate transaction boundary trace records.

SWX Short Wait Extended. The short wait has exceeded a 2-second limit and the system has put the transaction into a long wait. This long wait must be charged to the transaction response time. In other words, this active-to-wait transaction does not reflect a transaction boundary.

SZWG

(Transaction) Listed in the Wait Code column, Seize Wait Granted. The job was waiting on a seize conflict. The original holder released the lock that it had on the object, and the lock was then granted to the waiting job. The job that was waiting for the object is named on this line (WAITER --) along with the amount of time the job spent waiting for the seize conflict to be released. The object that is held is named on the next line of the report (OBJECT --).

SZWT Seize/Lock Conflict Wait. The job is waiting on a seize/lock conflict. The time (*/ time

/*) is the duration of the seize/lock conflict, and is included in the active time that follows it on the report. The holder of the lock is named at the right of the report line (HOLDER --). The object being held is named on the next report line (OBJECT --).

TSE   Time Slice End. The program shown in the stack entry labeled LAST is the program that went to time slice end. Every time a job uses 0.5 seconds of CPU time (0.2 seconds on the faster processors) between long waits, the system checks if there are jobs of equal priority on the CPU queue. If there are, then the next job with equal priority is granted the CPU and the interrupted job is moved to the queue as the last of equal priority. The job, however, retains its activity level. This is an internal time slice end. When a job reaches the external time slice value, there can be a job state transition from active to ineligible if another job is waiting for an activity level. When a job is forced out of its activity level, its pages are liable to be stolen by other jobs, and cause additional I/O when the job regains an activity level. The IBM-supplied default values of 2 seconds for interactive jobs and 5 seconds for batch jobs may often be too high, especially for the high-end processors. As an initial value, set the time slice at 3 times the average CPU seconds per transaction.

WTO   Wait Timed Out. The job has exceeded the wait time-out limit defined for a wait (such as a wait on a lock, a message queue, or a record).

WAITS
(Job Trace) The number of waits that occurred.

WAIT-ACT
(Job Trace) In the Job Trace Analysis Summary, this is the time between the ENDTNS and STRTNS programs is labeled WAIT-ACT. If you were tracing an interactive job and used the default STRTNS and ENDTNS parameters, this value is the time taken to process the transaction.

In the Job Trace Analysis I/O Summary, this is the time that the job was inactive, probably due to typing or think time by the user.

Wait-Inel
(System, Component) Average number of wait-to-ineligible job state transitions per minute.

Work Station Controller
(Resource Interval) The name of the remote work station controller.

WRITES
(Job Trace) The number of physical writes that occurred.

Writes per Second
(Resource Interval) The average number of disk write operations performed per second by the disk arm.

WRITTEN
(Job Trace) The number of physical writes that occurred for the entry.

WTO   (Transaction) Listed in the Wait Code column, Wait Timed Out. The job has exceeded the wait time-out limit defined for a wait (such as a wait on a lock, a message queue, or a record).

0.0-1.0   (Component, Resource Interval) The number of times the response time was between 0 and 1 second.

1.0-2.0   (Component, Resource Interval) The number of times the response time was between 1 and 2 seconds.

2.0-4.0   (Component, Resource Interval) The number of times the response time was between 2 and 4 seconds.

4.0-8.0   (Component, Resource Interval) The number of times the response time was between 4 and 8 seconds.

Related concepts

Host server administration

Related reference

Each report, regardless of the type or section, contains information in the header of the report that identifies characteristics of the data. Look here for descriptions of the header information.

The Transaction Report (RPTTYPE(*TNSACT)) option provides detailed information about each transaction that occurred in the job.

The Transition Report (RPTTYPE(*TRSIT)) option provides information similar to that of the Transaction Report, but the data (for example, processing unit time, I/O requests) is shown for each job state transition, rather than just the transitions shown when the job is waiting for work station input.

There are two sections to a lock report.

This sample report shows the Job Summary section of the Batch Job Trace Report. This section of the report provides the number of traces, the number of I/O operations, the number of seize and lock conflicts, and the number of state transitions for each batch job.

There are five sections of a Job Interval report.

There are two sections to the Pool Interval Report.

There are six sections to the Resource interval report.

Related information

Reporting configured capacity

Appendix. Notices

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